

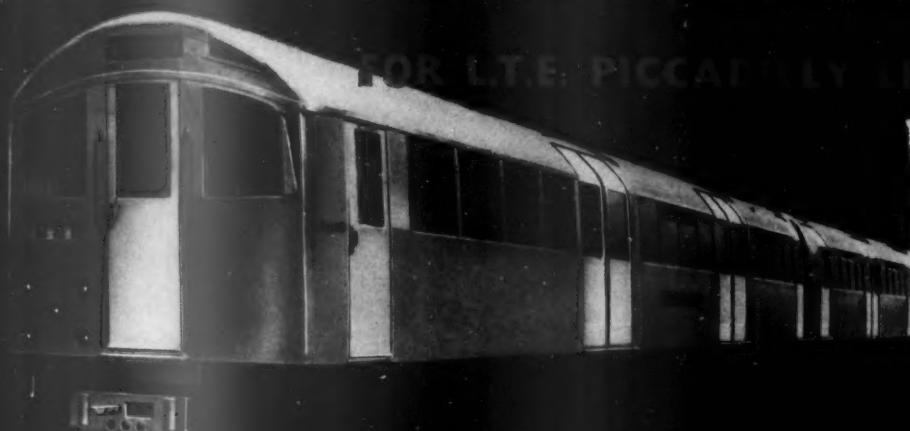
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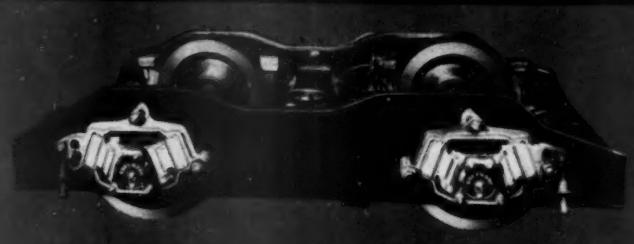
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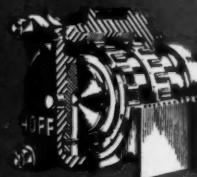


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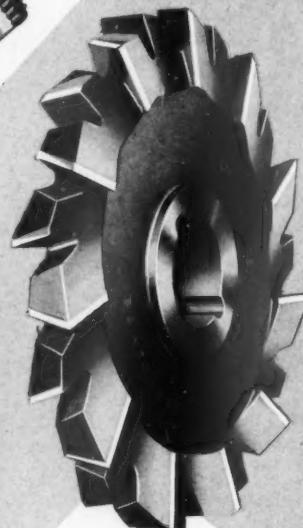
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Time for Constructive Action

THE restraint being exercised by all parties to the railway wages dispute is serving a useful purpose, for the prospect of strike action now is more remote. There is time for discussion on concerted action by the British Transport Commission and the railway trade unions. The Government is now prepared to reconsider at once its policy of restricting investment in the modernisation plan, which has resulted in deceleration in implementing it, on a condition. This is that the Commission and the unions can show that they together can effect economies in operation and co-operate in ensuring the most efficient use of manpower. The Government furthermore has offered to "give any necessary support to the reductions in uneconomic services"; some of these last might prove unpopular, and it is good that Government backing is promised. There is no question of a subsidy for the railways. Such a course was rightly condemned in strong terms in Parliament on Tuesday night by the Minister of Transport & Civil Aviation, Mr. Harold Watkinson, who said without exaggeration that it would be "an utter disaster. All discipline and hope would be lost." It is

not intended to increase the Treasury loans to tide over the working losses of the Commission, which is to have, in Mr. Watkinson's words, "the discipline of keeping within the amount it had asked for." Increases in many charges must price the Commission out of the market and passenger fare increases will not get Government support. On the other hand, the Prime Minister has stated not only that the Government maintains that arbitration awards should be accepted, but also that it noted that the evidence before the Railway Staff National Tribunal had shown that basic railway wages were low in comparison with those in certain other industries and employments. This seems to mean that whilst the unions must continue to show patience in abiding by the Tribunal majority finding against higher wages because of the financial inability of the Commission to pay them, there is a case, in the Government's view, for wage increases if and when they are made possible by economies in operation and acceleration of modernisation. Plans for the latter already exist. Neither course promises quick results; but it is significant that the Government appreciates the rapidity with which economies can be realised by introduction of diesel traction. That is one reason for its offer to reconsider the rate of investment in the modernisation programme, for restriction caused cuts in the supply of diesel locomotives and rolling stock in preference to retarding electrification, which is a long-term measure.

London Freight Traffic Problems

THE difficulties of providing a satisfactory goods service for London and, he might have added, all great cities where the basic railway layout is lines radiating from termini, were outlined last week by Sir Brian Robertson, Chairman of the British Transport Commission, in an address to the Rotary Club of London. He pointed out that the present plethora of goods stations and freight terminals in the metropolitan area was the result of factors which had changed. In part, freight traffic comes to London as a junction for re-distribution to other parts of the country. The railway pattern was designed to deal with this flow as it has developed since the early days of the industrial revolution; and conditions have changed. The layout, as he rightly explained, of many British Railways goods stations in London, designed for days when unlimited cheap labour was available, is unsuited to the times. It is hard to see why, according to Sir Brian Robertson, the rates which the railways "have to quote today" do not cover the present cost of the operation. The remedy surely lies with British Railways, in quoting rates within the latitude afforded by the charges scheme.

Improving Services

STEPS are being taken to remedy the London freight traffic situation; as Sir Brian Robertson remarked, close co-operation is needed between railway managements and staff to produce, and quickly, a much more effective set-up if general merchandise traffic into and out of the London area is to be regained by the railways and held at an economic rate. It is unfortunate that the scheme to divert goods traffic from the East via Bedford, Bletchley, and Oxford to Reading, described in our January 31 issue, should have been slowed down—a casualty of the restrictions on the modernisation programme. What other basic alterations in traffic flows are planned is not known. An example of careful research in re-planning services has been set by British Road Services, which have been able to reduce the volume of parcels and smalls traffic, formerly transhipped in London, by re-routing it; British Railways' problem is harder, but the need for improving services is equally great.

The Rhodesian Motive Power Problem

THE Government of the Federation of Rhodesia & Nyasaland decided, as recorded in our February 7 issue, not to implement, at least for the time being, the recommendations on the report on traction policy by Messrs. Freeman, Fox & Partners and Messrs. Merz &

McLellan; the report, which advocates electrification of certain sections of the Rhodesia Railways on the 50-cycle a.c. system, was the subject of editorial comment in our issues of January 17 and March 28. The reasons given for postponement were the reduction in sterling balances caused by the fall in the prices of Rhodesian copper, and the fact that the railways had provided for future needs by acquiring relatively large numbers of steam and diesel locomotives. A statement by the Federal Minister of Transport & Works, Mr. W. H. Eastwood, is reproduced on another page. This elaborates the reasons for not embarking on electrification. The difficulty is stressed of finding work for the steam locomotives displaced; they include many of considerable power, such as the "20th" class Beyer-Garratts, which can long continue to give good service.

Adequacy of Steam and Diesel Fleet

THE Minister refers to the change in the financial situation in Rhodesia since the consulting engineers were commissioned to undertake the inquiry, and to the need for the railways to minimise capital outlay because of shortage of loan capital. The present situation may be only temporary; but even although capital were to become more readily available, it is doubtful whether the management would decide on electrification, despite the economies in running costs which, as the consultants' report shows, could be achieved by electric traction. The official statement refers to the existing motive power as being calculated to be adequate for some years to come, though later it may be found necessary "to make small additions to the fleet." This could mean steam or diesel-electric, or both; in any case, the Rhodesia Railways management seems to be quite satisfied with its Beyer-Garratts and diesel-electric locomotives.

Overseas Railway Traffics

PARAGUAY CENTRAL RAILWAY receipts for the week ended March 28 were G1,351,048 compared with G1,566,603 in the corresponding week of 1957, a decrease of G215,555. This is the third successive week that receipts have fallen below the level of a year ago, following a four-week period when receipts were almost double those of the previous year. The high receipts in February were almost entirely caused by record dispatches of sugar. Aggregate receipts at March 28, from July 1, 1957, were G69,201,582 compared with G72,204,565 in the corresponding period of 1956-57. Railway operating revenues of the International Railways of Central America for February were \$1,260,718, a decrease of \$249,440 compared with February, 1957. Net income for the month was a loss of \$12,161 (\$172,271 profit).

British Achievement Overseas

THE part played by British railwaymen in developing railways in African and Asian territories was eloquently described by Sir Arthur Kirby, Commissioner for East Africa in London, at the dinner at the Transportation Club, S.W.1, last Tuesday. Nobody is better qualified to speak on this subject; before his last appointment overseas, when he was General Manager of East African Railways & Harbours, he occupied senior positions on railways on the Gold Coast, East Africa, and Palestine, where he was General Manager of the Palestine Railways & Ports Authority. He pointed out that the field for British railwaymen overseas is contracting, as the policy is being implemented of appointing indigenous inhabitants to managerial positions. Nevertheless the high regard felt for British railway officers has built up a fund of goodwill in the countries where they served with such efficiency and devotion. The great majority were trained on a British railway, and not a few, like Sir Arthur Kirby and others, now serving in East Africa, on the G.W.R. He mentioned Egypt as one country where British railway officers and, in consequence, British methods have left a high reputation. India is another. Many British railway-

men now retired can see the work they began overseas bearing fruit today. This British achievement must not be forgotten. Nor must one forget the role of the railways, built often with British capital, and once managed entirely by British staff, in opening up underdeveloped countries, which has been of good service to British industry.

A Lesson from China

VISITORS returning from China speak of the present high degree of cleanliness and neatness of the trains and stations. The locomotives are kept clean and their black livery is set off by a white line along the running board, with scarlet wheels and buffer beams lined in black and white. Passenger carriages are now being painted in grass-green, with chrome-yellow cant rails, window rails, and belt rails. At every water stop the exteriors of coaches are washed, while internal sweeping and mopping proceeds continually during a journey. A former officer of the Chinese railways, an Englishman, who has recently re-visited China, is of the opinion that, efficient as the several railways in that country always were, there is now a brisk, professional spirit which they formerly lacked; this he attributes to the keenness and good discipline of the staff and to efficient management. Efficiency, cleanliness and neatness of plant, and good morale of the staff are closely linked. No doubt the availability of labour is a main reason for clean locomotives; but it is remarkable that China should now set an example once afforded by British railways.

A Useful Dictionary

THE "General Dictionary of Railway Terms" in five languages, drawn up by the International Railway Documentation Bureau of the International Union of Railways, and the subject of a notice on another page, is the most comprehensive work of its kind ever attempted. The languages are English, French, German, Italian and Spanish, and English and Spanish terms are included as used in the Americas, based on the Panamerican Railway Congress Association vocabulary. An attempt has been made to cover all railway activities, and the dictionary includes not only specifically railway but also general technical terms commonly used in railway work. It would be foolish to dwell on the few errors and omissions noticed among over 40,000 entries—8,000 in five languages. Mistakes include *nombre de spires* (5524) wrongly translated as "number of windings;" there is a lack of precision as to the English use of "vestibule" (1855 and 8591). Amongst omissions are some English terms: "box boy," "fogman," and "half-day excursion"; and certain terms used in tariff work, but unfamiliar in general usage, such as the French *errements*, might well have been included. These, however, are minor blemishes on a considerable achievement.

Prospects for Diesel Traction

DESPITE the increasing world demand for fuel oil, which has doubled every 10 years, since records have been kept, the internal combustion engine is believed by many to be unlikely to be superseded by other forms of power for transport, including railways, in many parts of the world, at least in the foreseeable future. This view was expressed by Lt.-Colonel S. J. M. Auld, Director & European Manager of Alco Products Incorporated, and a Past-President of the Institute of Petroleum, speaking as principal guest at the annual luncheon of the Diesel Engineers & Users Association in London last week. He drew attention to the view that, because natural oil resources were becoming exhausted, the diesel and other forms of internal combustion engine already were obsolete. On the contrary, he believes that this form of motive power will continue to be used for a considerable time to come; that a balance between fuel oils and other sources of power is likely to be achieved; and that time is on the side of the combustion engine because such sources of power as nuclear energy are not competitive.

Electric Power from Nuclear Sources

NUCLEAR power is still subject to poor efficiencies through the use of combustion boilers, heat exchangers, and so on. Lt.-Colonel Auld maintains that even when it can be obtained in quantity and very cheaply, there will still be difficulty in applying it even to railways; and that electrification, while suitable for a concentrated railway system, as in this country, does not appear a satisfactory step in less densely populated and less developed areas of the world. In view of the development of 50-cycle traction, in the Belgian Congo, for instance, we feel this view to be too sweeping. If natural supplies of oil decrease, he believes that the petroleum industry will turn to other sources of oil fuel such as coal, by the hydrogenation of which oil may be produced. Oil, in his opinion, "cannot go out of fashion," and the industry will find ways of meeting world requirements.

Rebuilding a Suburban Line

THE large amount of civil engineering work necessitated by electrification of the Liverpool Street to Enfield Town lines of the Eastern Region was evident on an inspection trip we made last Sunday with Mr. H. W. Few, Traffic Manager (Liverpool Street), Eastern Region. It amounts to virtual reconstruction of the 10-mile Enfield Town branch. Reference to the many works in hand is made on another page. The railways concerned were laid out 80-100 years ago for fairly light steam trains, and it has been necessary to alter many existing structures, more particularly bridges, apart from new structures for distributing electric current. Much lowering of track has been necessary. As this work involves much interference with train services, the opportunity has been taken to anticipate ordinary maintenance work which normally would fall due in the first few years after electrification; in this way interference will be avoided with the eventual intensive electric service. With this electrification and associated preparatory work, construction of Temple Mills marshalling yard and alteration of the approaches thereto, and the normal work on track and structures in a complex and heavily trafficked metropolitan area, the tasks of the Stratford District Engineer and his staff are as great as those of any engineering district we know.

Reconstruction at Barking

ONE of the most difficult tasks to be undertaken by the Eastern Region of British Railways in connection with the Barking flyover and station reconstruction scheme, described in our March 21 issue, is the maintenance of train services throughout the duration of the work. Usually the tracks are re-laid clear of the required working area and coupled in to the existing alignment at night, or on a Sunday under possession of the line, but even this work requires much careful planning. The temporary deviation of the main Fenchurch Street-Southend lines, to allow construction to proceed on the western end of the diversion at Barking East and to clear a further working area for parts of both flyovers west of the station, was recently carried out and involved extensive permanent way and signalling alterations. In the course of a weekend's work most of the lines on the south side, east of the station, were taken up and re-laid on a new alignment and altogether five sets of points and six diamond crossings were laid. The whole of the temporary signal work in connection with this changeover was planned and executed in four months.

Main-line Diesels for the Eastern Region

THE first of 10 Type "4" 2,000-b.h.p. diesel-electric locomotives, ordered for British Railways in the autumn of 1955 as part of the Modernisation Plan, was officially delivered last week to the Eastern Region. Details of a demonstration run and a description of the locomotive appear elsewhere in this issue. In general, the design of the locomotive follows the tradition of the builders, the English Electric Co. Ltd., which has been

evolved over a long period, and as a result of considerable operating experience with its products in various parts of the world. The equipment of the new locomotive is based on that of the first five main-line diesel-electric locomotives to go into service on British Railways, the two 1,600-b.h.p. units built by the former L.M.S.R. (the first diesels of this power to run in this country), and the two 1,760-b.h.p. and one 2,000-b.h.p. locomotives built in 1951 and 1954 respectively for the Southern Region. All these five locomotives now have an aggregate of some 2,500,000 miles in service, and the experience gained has doubtless made a valuable contribution to the new design. The only inherent disadvantage of the new design seems to be its weight, which is considerably greater at 133 tons than some recent diesel-hydraulic designs of similar power.

Last British Atlantic

THE withdrawal earlier this month of Southern Region locomotive No. 32424 removes the last Atlantic tender engine from British Railways. H. A. Ivatt introduced the first, in 1896, so that this wheel arrangement has had a span of 62 years in this country. But Ivatt's first production had a narrow firebox; this was developed in 1904 into the celebrated Great Northern No. 251 with wide firebox. That was the design adopted, with modifications to boiler pressure and cylinder dimensions, by Douglas Earle Marsh, Ivatt's principal assistant, when he left Doncaster to become Locomotive Superintendent of the London Brighton & South Coast Railway. He ordered two batches, five saturated steam engines in 1905 from Kitson, and six superheated engines from Brighton works in 1911. No. 32424 was one of the second batch. In the early years of the Southern Railway the first batch was given superheaters. Originally these engines worked London-Brighton trains, including the "Southern Belle," but their best-known later working was on the Newhaven boat trains, until 1948-49. Though they never had the long, hard continuous steaming to which Gresley's superheated rebuilds of Ivatt's engines were subject on the L.N.E.R. in the 1920s, the Brighton engines were successful in all their phases except that unfortunate one in 1947, when No. 2039 was rebuilt with sleeve-valve cylinders and chain-drive-motion as a "guinea-pig" for the "Leader" class.

C.T.C. in Rhodesia

GOOD progress is being made in installing C.T.C. on the Rhodesia Railways, where it is of the utmost value in increasing capacity over the single lines. Now, at the end of April, the railways have just under 250 miles of C.T.C. in operation. This is split into two parts: 97 miles between Heany Junction and Gwelo on the East line, and 148 miles between Sawmills and (New) Wankie on the North line.

Recently the older Heany-Gwelo section has been equipped with power-operated points except at Somabula, where a local signalling system is to be installed. Somabula is becoming increasingly important as a junction, as it is here that the line from Lourenço Marques joins the main Salisbury-Bulawayo route, and traffic on this South-East line continues to grow.

On the North line the Dett panel controls 116 miles of track between Gwaii and Wankie with all main-line points power operated. The Sawmills panel eventually will control train movements on the section from Mpopoma to Gwaii but at present only part of the panel is operating, that is the Sawmills-Gwaii section. It is expected that the Mpopoma-Sawmills portion, controlling approximately 55 miles, will be in operation in about four months.

At (New) Wankie a small C.T.C. panel is to be installed; this will control train movements between Wankie and Thomson Junction. These two places are some eight miles apart and there is one intermediate crossing point. There will be another panel at Livingstone, controlling the line from Thomson Junction to Kalomo. Considerable progress has been made with the civil engineering works south of Livingstone and on this section, some 70 miles long, departmental signalling work is going ahead and

it remains for the contractor to begin installation of the actual C.T.C. apparatus. North of Livingstone no work has yet been done, nor has any progress been made on the installation of the short section between Khami and (Bulawayo) Westgate on the south line.

On the East line electric track signalling at Cement and automatic signalling on the double track leading out of Bulawayo is already in operation; it is 13 miles from Bulawayo to Cement. Work is progressing in extending the double track for another seven miles from Cement to Heany Junction, where the C.T.C. system begins. Similar electric signalling will be extended to this new double track, including Heany Junction.

On the remaining parts of the main line, that is Kalomo-Ndola and Gwelo-Umtali, it is expected that installation should be commencing shortly.

Eastern Region Summer Passenger Timetables

AN outstanding improvement effected in the summer train service of the Eastern Region is in the morning and evening residential trains over the Great Eastern Line between Liverpool Street, Clacton-on-Sea and Walton-on-Naze, with the help of "Britannia" class Pacific locomotives. A new express will leave Liverpool Street at 5.27 p.m., covering the 51.7 miles to Colchester in 56 min., and with a stop also at Thorpe-le-Soken (but no Walton connection) reaching Clacton at 6.53 p.m.; the 86 min. for the 72 miles will be the fastest time yet scheduled. The 4.56 p.m. down will start 2 min. later, but with the same stops as now will reach Clacton at 6.42 p.m., and Walton at 6.51 p.m., both 13 min. earlier. The 5.36 p.m. down will start 4 min. later, but despite additional stops at Chelmsford and Witham will reach Clacton at 7.18 p.m., 1 min. earlier. These three trains, with the unaltered 4.36 p.m. down, will all include buffet cars.

In the up direction the 6.48 a.m. from Clacton will start at 6.58 a.m., but reach Liverpool Street at 8.42 a.m. as now; the 7.40, starting at 7.51, will arrive at 9.20 instead of 9.21 a.m.; and the 8.5, starting at 8.14, will arrive at 9.52 instead of 9.55 a.m.; accelerations of 10, 12 and 12 min. respectively. The 6.26 (previously 6.27) a.m. slow to Colchester will become a through buffet car train to Witham, Chelmsford and Liverpool Street, arriving at 8.39 a.m.

On the Colchester main line the 8.30 a.m. down is to reach Norwich at 11.8 a.m., 15 min. earlier, without omitting any existing stops. Buffet cars will be provided on the 3.45 p.m. from Norwich to Liverpool Street and the 7.30 p.m. back, also on the Cambridge line 6.51 and 9.54 a.m. and 3.24 p.m. trains from Liverpool Street to Cambridge, the 7.59 (present 8.2) a.m. and 5.45 p.m. from Cambridge to Liverpool Street, and 8.30 a.m. from Bishops Stortford to Liverpool Street. Most of the up Cambridge line fast trains are to be decelerated from 2 to 4 min. in running.

Over the Great Northern main line the most important change is that the 10.10 a.m. from Kings Cross to Glasgow will start at 11 a.m., so better spreading the morning facilities from London to the North and conforming to the even hour departure times. The 3 p.m. down Newcastle express, however, will revert to its previous 3.10 p.m. departure, though still non-stop to York. The summer 9.50 p.m. from Kings Cross to Edinburgh (9.55 p.m. last year and then second class only) will carry both classes of passenger and include sleeping accommodation; it will call at Doncaster instead of York and Darlington and be non-stop from Doncaster to Newcastle.

There are to be cuts in both directions in practically all the express train times between Kings Cross and Peterborough, though most of the minutes so gained will be neutralised by increased times further north. The 1.15 a.m. down will be booked to cover the 76.4 miles from Kings Cross to Peterborough in 75 min., five other down expresses will take 78 min., three 79 min., and three (one with an intermediate stop at Huntingdon) 80 min. The 9 a.m. down Newcastle express will be started as usual after the 9.30 a.m. down "Elizabethan," this year at 9.40 a.m., and

will be booked over the 105.5 miles to Grantham in 104 min. One important train which has escaped the tide of acceleration, however, is the "Yorkshire Pullman"; its times of 177 min. for the 156.0 miles from Kings Cross to Doncaster, and 176 min. in the reverse direction, will both be 21 min. longer than those operative in 1939 with the same train. Services on which supplementary fares are charged ought to offer an advantage in speed as well as comfort, and this is not the case with the "Yorkshire Pullman."

In the up direction last summer's 11.17 a.m. from Leeds to Kings Cross will leave at 11.45 a.m., and curtailing the Retford stop from 13 to 2 min., and omitting that at Newark, will reach Kings Cross 2 min. later, at 4.8 p.m., an acceleration of 26 min.; the through Ripon and Harrogate portion also will start 26 min. later, at 10.38 a.m. from Ripon. This train and the summer 2 p.m. from Leeds replace the winter 12.30 p.m.; the former also will be accelerated to reach Kings Cross 12 min. earlier, at 6.6 p.m. The recently effected acceleration of the up "White Rose," with the omission of all stops between Doncaster and Kings Cross, is being made permanent, with a Kings Cross arrival at 7.18 p.m., 32 min. earlier than shown in the current winter timetable.

The up "Northumbrian" will be started from Newcastle at 12.50 instead of 12.30 p.m., but though this will better spread the departures from Newcastle to the south, the train is being decelerated by 17 min., not reaching London until 6.22 p.m. On Mondays only the "Norseman" is to be advertised as a relief to the "Northumbrian" and the "Flying Scotsman," leaving Newcastle at 12.32 p.m., covering the 80.2 miles to York in 77 min. and the 188.2 miles on to Kings Cross in 3 hr. 24 min., with an arrival at 5.22 p.m., 64 min. acceleration on last summer's times. The Wednesday and Thursday workings of the up "Norseman," leaving Newcastle at 8.40 a.m., also will be speeded up by 21 min., arriving at 2.15 p.m., but this train will be 45 min. slower than on its Monday working. Most of the up Great Northern expresses will reach London 3 or 4 min. before their present times.

Most of the intermediate stops made by the diesel trains between Grantham and Lincoln, with the exception of Leadenham, are to be cut out, and with improved Grantham connections, the service between Lincoln and Kings Cross is radically improved as compared with a year ago. In the summer of 1957 the seven down London-Lincoln services averaged 3 hr. 6 min.; from June onwards there will be nine averaging 2 hr. 49 min. Similarly, in place of eight up averaging 3 hr. 13½ min. there will be ten averaging 3 hr. 1 min. The 8.23 a.m. from Cleethorpes to Kings Cross will stop additionally at Huntingdon, giving that station another non-stop working to London, at 11.30 a.m., with an arrival at 12.43 p.m.

Railway Grouping in the U.S.A.

THE editorial reference in our issue of November 15, 1957, to the possibility of a merger between the New York Central and Pennsylvania Railroads is a reminder of various similar proposals that are now in process of discussion between major railways in that country. The aim is to reduce wasteful competition and administrative expenses; a main difficulty in carrying such proposals into effect, with so many individual railways and competing routes, is the opposition of other railways which consider that their interests will be adversely affected by the establishment of powerful railway groups in or adjacent to their territories. So the Sherman Anti-Trust law and similar enactments directed against monopolies make the path of those who would negotiate railway fusions a lengthy and a difficult one.

As a recent example, the fight between the Pennsylvania and Atchison, Topeka & Santa Fe Railroads for the acquisition of the Toledo, Peoria & Western—an important "bridge" line for freight to the south of Chicago—was ended by the two companies agreeing to acquire the line jointly. The sanction of the Interstate Commerce Commission for this procedure, however, is now held

up by the Minneapolis & St. Louis, which is taking its case to court in its determination to secure, if it can, exclusive control of the T.P. & W.

Another example of an obstacle in an amalgamation plan is seen in the attempted acquisition by the Atlantic Coast Line of the 571-mile Florida East Coast Railway, which provides the former's only through access to the Florida coast, whereas the competing Seaboard Air Line has its own tracks throughout. In this case also the Interstate Commerce Commission approved the plan, but its implementation has been held up by the Supreme Court, which has decided that such an acquisition would have been forced rather than voluntary, and therefore illegal. The two companies now are trying to work out an agreed plan which will satisfy the Supreme Court and enable the scheme to go through.

Two affiliates of the Atlantic Coast Line—the Louisville & Nashville and the Nashville, Chattanooga & St. Louis—which previously worked in close association but under separate managements, have lately been amalgamated into a single system operating 5,700 route miles of line; 35 per cent of its capital stock is owned by the A.C.L. But whereas a proposed merger of the 5,098-mile St. Louis-San Francisco Railway with the Central of Georgia, which until now has been controlled by the Illinois Central, was authorised in July last by the Interstate Commerce Commission, it is held up because of appeals against the decision by both the Illinois Central and Seaboard Air Line Companies.

Other possible amalgamations of great importance are the subject of study which shortly may bear fruit. One such is a possible merger of the Great Northern; Northern Pacific; Chicago, Burlington & Quincy; and Spokane, Portland & Seattle Railroads. The G.N.R., with 8,285 route miles of line, and the N.P., with 6,862 miles, parallel one another near the northern frontier of the U.S.A. across from St. Paul and Minneapolis to Spokane and Seattle. Each owns a half-share in the 8,804-mile Burlington, which continues their main lines from St. Paul to Chicago, and feeds them with its cross-country route from Kansas City to Billings and Shelby, besides having its own important main line from Chicago to Omaha and Denver. On the Pacific side the G.N. and N.P. jointly own the Spokane,

First steps have been taken by the Erie; Delaware, Lackawanna & Western; and Delaware and Hudson Railroads—2,207, 962, and 771 miles long respectively—towards a possible amalgamation; already certain operating facilities of the Erie and the Lackawanna, which duplicated one another, have been co-ordinated. But their managements consider that at least five years will be needed before the merger studies can be completed, the shareholders brought to agreement and Interstate Commerce Commission approval obtained. Another merger that has been under consideration for some time past is between the Missouri Pacific and the Texas & Pacific Railroads; the former already holds the majority of the stock in the latter, and the two systems work in close conjunction.

All such amalgamations, however—with the possible exception of that of the Great Northern and Northern Pacific and their affiliates—are small compared with the possible New York Central-Pennsylvania merger. The competing interests involved here are so many that the task of forcing the plan through against very severe opposition is certain to be one of the greatest difficulty and complexity. The great cities on the two principal main lines—Philadelphia, Pittsburgh, Albany, Buffalo, Cleveland, Toledo and others—which think that their interests might be threatened by undue concentration on one main line or on the other, might well be among the opponents.

Australian Commonwealth Railways

THE report on the Commonwealth Railways operations for the year ended June 30, 1957—a copy of which we have received from Mr. P. J. Hannaberry, Railway Commissioner—shows a gross revenue from the four systems they comprise totalling £A4,961,545, an increase of £A220,641 over the corresponding figure for 1955-56. Gross expenditure increased by £A421,362 during the period to £A3,597,208, and the surplus revenue over working expenses was £A1,364,337, or £A200,721 less than in the previous year. The principal results of working the four systems during 1955-56 and 1956-57 were:—

Heading	Year ended June 30	Trans-Australian Railway	Central Australia Railway	North Australia Railway	Australian Capital Territory Railway	Total for all Railways
Miles open for traffic	1957	1,108 miles	828½ miles	316½ miles	5 miles	2,258 miles
Earnings	1956	£2,744,776	£1,852,406	£119,076	£24,646	£4,740,904
	1957	£2,766,099	£2,021,085	£151,479	£22,882	£4,961,545
Working expenses	1956	£1,733,809	£1,216,167	£181,496	£44,374	£3,175,846
	1957	£2,085,916	£1,217,111	£244,008	£50,173	£3,597,208
Productive train-miles	1956	1,244,558	951,390	129,851	10,370	2,336,169
	1957	1,320,114	672,196	133,180	10,375	2,135,865
Gross ton-mileage	1956	770,919,031	469,962,775	16,395,372	2,312,095	1,259,589,273
	1957	819,990,721	456,706,904	18,895,390	2,187,865	1,297,780,880
Results of working (excluding interest)	1956	+£1,010,967	+£636,239	-£62,420	-£19,728	+£1,565,058
	1957	+£680,183	+£803,974	-£92,529	-£27,291	+£1,364,337
Interest (including exchange)	1956	£108,806	£201,208	£73,989	£1,422	£385,425
	1957	£108,432	£199,527	£73,271	£1,408	£382,638

Portland & Seattle, 962 miles long, which gives them direct access to Portland as well as a direct main line from Portland to Seattle. Such an amalgamation would create a system of nearly 25,000 route miles, one of the most extensive in North America. The most powerful opponent is likely to be the Chicago, Milwaukee, St. Paul & Pacific, which is the only company to possess its own track throughout from Chicago to Seattle.

The Milwaukee itself was involved until a short time ago in another amalgamation proposal, with the Chicago & North Western Railway, but this was dropped when the latter came under new management. One result was that the C.N.W. relinquished its long-standing connection with the Union Pacific, whose through trains between the Pacific Coast (Los Angeles, San Francisco, and Portland) and Chicago were almost throughout their history worked by the North Western between Omaha and Chicago. All these through workings are now in the hands of the Milwaukee Company, but the latter declares that it regards the door to amalgamation with the C.N.W. as still open.

On the Trans-Australian Railway revenue exceeded working expenses by £A680,183 and although this figure was lower than its 1955-56 counterpart by £A330,784; the previous year's surplus was a record. The increase in operating costs was due mainly to (a) increased labour becoming available and making heavier sleeper-renewals possible, (b) a greater engine-mileage run, and (c) more extensive repairs of and modifications to rolling stock.

Results on the Central Australia Railway relate to the newly-built Stirling North (Port Augusta)-Marree 4-ft. 8½-in. gauge line—built to replace the heavily-graded 3-ft. 6-in. gauge section—so far as it was open for traffic during the year, (2) the 3 ft. 6 in. gauge (partly parallel) line from Port Augusta to Alice Springs; and (3) the Port Augusta-Hawker 3 ft. 6 in. gauge branch as it became after traffic was discontinued between Hawker and Copley. The availability of the new standard-gauge railway as far as Copley by June 27, 1956, on which diesel-electric locomotives hauled greater train loads, and the running of longer and heavier trains on the narrow-gauge section north of Copley,

hauled by NSU diesel-electric locomotives, enabled a considerable over-all reduction to be made in the number of train- and engine-miles run, with consequent saving in costs. These savings were offset to a considerable extent by the carrying out of an augmented programme of rolling-stock repairs, and of a heavier re-sleeping programme as compared with the previous year. The running of a second mixed train to and from Alice Springs each week during the tourist season—about half the year—increased traffic and dining-car costs. Actually, the 4 ft. 8½-in. gauge railhead reached the Leigh Creek coal-fields on May 17, 1956, and Marree on July 27, 1957.

On the North Australia Railway the operating loss was largely caused by the serious washaways, additional essential track maintenance (again possible thanks to more man-power being available) and greater general working and maintenance costs except on the mechanical side, where they decreased as a result of the use of diesel-electric locomotives for the bulk of the mileage run. The increase in the deficit on working the Australian Capital Territory Railway during the year confirms the view that this isolated five-mile line is unlikely to pay its working expenses in present conditions. These two railways are good examples of lines retained in the national interest, though absolute liabilities from the operational point of view.

On the Trans-Australian Railway some passenger trains are made up of two sets of sleeping, lounge and dining cars and two roomettes—constructed at Port Augusta shops; they are hauled by two diesel-electric locomotives. On the Central Australia Railway the train services were complicated by the different gauges and transhipment facilities available from time to time.

Serious damage was caused to the North Australia line by several days' heavy flooding and typhoon conditions beginning March 4, 1957. Washaways occurred throughout the section. Southwards from Darwin River the line could not be reopened until April 9. Flooding also damaged the Central Railway in July and October.

Steam locomotives were being used on the Commonwealth Railways only for shunting, 21 diesel-electrics handling all the trains. Eleven of them are of 1,500 h.p. and ten of 1,750 h.p. On the Central Railway coal trains of 2,540 tons were being hauled by one locomotive, but it was intended to run 5,500-ton (gross) trains with two diesel units as soon as ballasting was completed. The old 3 ft. 6 in. line to Marree had 1 in 46 gradients and 6½-ch. rad. curves, whereas the new 4 ft. 8½ in. gauge line has a ruling gradient of 1 in 180 and curves of 60-ch. rad. and easier.

The Downward Trend in Railway Freight Traffic

(By a correspondent)

IN the first four-week period of 1958, British Railways originated 10·7 per cent less freight-train traffic and worked 14·5 per cent fewer ton-miles than in 1957. In the second period to February 23, the railways again lost over 2,000,000 tons of traffic, or 8·7 per cent of 1957 forwardings, while ton-miles were down by 10·9 per cent. A note in No. 2 of *Transport Statistics* suggests that 1958 carryings by public transport are not comparable with those for 1957 because short supplies of oil diverted traffic from road to rail between November, 1956, and May, 1957. That is rather an extreme statement, which exaggerates the effect of the temporary oil restrictions. In any case a few comparisons with statistics for February, 1953, will show how our railways are retrograding as freight carriers after five years of sustained industrial activity.

Originating tonnage in February, 1953, was 23,067,000; in February last it was 21,524,000, a decrease of 1,543,000, or 6·6 per cent. Merchandise (including livestock) railed this year amounted to 3,053,000 tons, against 3,904,000 in 1953, a decrease of 21 per cent; the reduced tonnage accounted for 76 million fewer ton-miles, a drop of 14·7 per cent. Mineral tonnage was 4 per cent lower at

4,630,000 tons and produced 11 per cent fewer ton-miles. Coal and coke declarations of 13,841,000 were 3·4 per cent below the level five years ago and the resultant ton-miles decreased by 73 million, or 8 per cent.

When the figures for the first two periods of 1958 are combined, it appears that, compared with the corresponding eight weeks of 1953, British Railways have lost about 3,500,000 tons of traffic, or fully 7 per cent of their carryings, and the working of 430 million ton-miles, or 12 per cent of freight movement. The advance statement of traffic receipts to March 23 does not indicate any marked change in the tendency of freight statistics to deteriorate. The next number of *Transport Statistics* will give details of the work done in the first 12 weeks of this year; but no hint of the trend of operating expenses. At the critical stage which the decline in freight business has reached, the British Transport Commission would be wise to explain how operating costs are being altered and to indicate the steps being taken to effect economies.

Letters to the Editor

(The Editor is not responsible for opinions of correspondents)

Soil Mechanics on British Railways

April 18

SIR.—On page 384 of your issue of April 4 you were good enough to give space to a review of the paper entitled "Soil in British Railways Civil Engineering" which I gave to the Society of Engineers.

There are some errors in your article which could give false impressions. The third paragraph is a particularly unsatisfactory transcript of my remarks, since I have never heard the word "glutinous" substituted for the accepted term "cohesive" and the second and third lines of the paragraph are a confusion of statements concerning both cohesive and non-cohesive soils. Also, in this paragraph, it would appear that I discoursed on angles of repose for clay and that I related these to the type of clay.

I have just read the transcript of my verbal remarks at the meeting and it is quite clear that I made no such incorrect statement. It is, of course, well known that there is no such thing as a single angle of repose for a slope in clay of any particular character. For any one clay the angle at which a slope will remain stable depends on many factors, including the type of clay, the vertical depth of the slope, and the moisture content.

In the fifth paragraph of your review, you state that the model tests which we carried out in the Southern Region to study the soil mechanics and economics of mast foundations inspired the use of a power-auger fitted to a special train put into service in the London Midland Region.

Following our tests, I certainly made recommendations that the larger power-driven auger should be adapted for this purpose and I have reason to believe that these recommendations were taken into account in the development of the train used in the Eastern Region. I am quite unable to say whether the similar L.M.R. train was inspired in any way by the above-mentioned work, though it is, of course, possible.

I should be obliged if you would kindly publish this letter to allay any ill-feeling and misunderstanding which may have arisen as a result of your review.

Yours faithfully,

A. H. TOMS
Research Assistant to
Chief Civil Engineer

British Railways, Southern Region,
Waterloo Station, S.E.1.

[We much regret that we were informed wrongly that Mr. Toms was on the staff of the British Transport Commission, British Railways Division Research Department, Derby. His appointment is as shown above, and he is in no way directly concerned with the activities of the Research Department.—ED., R.G.]

THE SCRAP HEAP

Dead Loss?

As stated in the telephone recently, Mr. . . . has proved unsatisfactory. We have therefore given him notice to expire on the 28th of February, 1958.—*From a letter to the District Traffic Superintendent, Kampala, E.A.R.&H., from a training school, quoted in "East African Railways & Harbours Magazine."*

The Côte d'Or

The best way of visiting the vineyards of Burgundy is by the *tacot* or toy railway (a sort of Dymchurch-Hythe affair) which leaves Dijon hourly and winds its way leisurely among the vineyards, stopping at those villages with immemorial names. It is a typically French machine, rickety, aged, unpunctual, with a talkative and agreeable conductor. It goes through villages with the giant wine presses of the Dukes of Burgundy still working at vendange time, when . . . the air is heavy with the scent of newly pressed grapes.—*From "The Financial Times."*

Malayan Pacific Retired

After over 50 years of service on the metre-gauge Malayan Railway, 4-6-2 locomotive No. 501.09 is being withdrawn from service. It was built by Kitson & Co. Ltd., in 1914, and has been at work ever since. There were 10 engines of this class, formerly known as the "H" class; they weighed 78.4 tons in working order; the boiler pressure was 180 lb. per sq. in. but with No. 501.09 this was reduced to 150 lb. per sq. in. some years ago as a concession to its age. The engine has two cylinders with a bore of 15½ in. and a stroke of 24 in. and is fitted with Walshaerts valve motion.

These Pacifics worked the mail trains in the 1920s, looking very smart in their black livery with the handrails,

motion, boiler bands, and tyres, all highly polished.

During the Japanese occupation of Malaya, No. 501.09 was transferred to work in Siam. It has been decided not to break the engine up for scrap, but to re-paint and polish it to something of its former glory, and to give it a place of honour as a relic.

P.W. Gang Protects Baboons

A Rhodesia Railways interpreter has reported a strange incident when he was visiting a permanent way gang:

"As we climbed down from the guard's van a terrible screaming came from behind a clump of dense bush very close to us and we realised this was a baboon in its death agony. Then came a tremendous roar. . . . This sounded like a lion. Next came the steady crunch of bones. At this point a strange thing took place. The remainder of the baboon troop came running out of the brush and squatted nervously along the track next to where the gang was working. Although baboons normally keep their distance they were quite happy to trust themselves to human protection. We had to board the train again soon afterwards and did not feel tempted to peer through the thick bush to see what had taken place there."

Re-enter the Great Eastern

A feature of some of the booklets "Introducing the Traffic Manager," and relating to the traffic organisation of the Great Eastern Line of the Eastern Region of British Railways, which we noticed in our March 21 issue, is the reintroduction of the use of the coat of arms of the old Great Eastern Railway. The only change is the omission of the word "Railway." This device gave an excellent and compact armorial guide to the territory served by the line, with the City of London in the centre, surrounded by (clockwise, starting top



Arms of the former G.E.R. reproduced in some Eastern Region publications

left) Middlesex, Maldon, Ipswich, Norwich, Cambridge, Hertford, Northampton, and Huntingdon; the last six are the arms of county towns. In the foreword to these booklets, the Great Eastern Line is described as covering "broadly East Anglia, an area similar to that served by the old Great Eastern and Midland & Great Northern Railways. It is under the control of a Line Traffic Manager, with Traffic Managers located at Liverpool Street, Cambridge, and Norwich."

Wot! No Change?

"When the machine makes a humming noise it will only take pennies"—Notice on the 5d. ticket machine at Charing Cross Underground Station)

Sing a song of fivepence.
Should you think it strange
To hear robots humming,
They're just short of change.

Hear the pennies dropping,
One, two, three, four, five,
Coppers all cascading
In an endless dive.

Will "Bring out your mouldies"
Strike a chord again,
As you fumble, fuming,
While you miss your train?

If these changeless robots
Now propose to croon,
Let us hope to goodness
They'll do so in tune.

Drury Lane for drama,
Sadlers Wells for ballet,
What price Charing Cross now
As transport's Tin Pan Alley?

Rally round, you youngsters,
Spare the Board these shocks;
Coppers to the rescue,
Clear that money-box!

A. B.



Malayan Railway 4-6-2 locomotive built by Kitson & Co. Ltd. in 1914 and now to be preserved on withdrawal from service

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

RHODESIA

Diesel Trials on South East Line

A series of load and timing tests are being made on the South Coast railway line of the Rhodesia Railways with a 2,000-h.p. English Electric diesel-electric locomotive. This has been transferred for the purpose to Bulawayo from Umtali. The tests are expected to be completed by April 22, when the unit will have made six return trips between Bulawayo and Malvernia hauling different classes of goods and passenger trains.

It is expected that diesel traction will be introduced on the South Coast line in about three months; for this purpose a further 12 of the 2,000-h.p. diesel locomotives are being delivered by English Electric to a generally similar design to the original 23. Of these ten are intended for the South Coast services.

EAST AFRICA

Course for Assistant Officers

East African Railways & Harbours recently held a nine-day course for assistant officers and cadets at the Railway Training School, Nairobi. Instruction was given in E.A.R. & H. history, organisation, policies, and so on.

INDIA

Railways' Steel Requirements

During 1957-58 the steel requirements of the railways are estimated at 993-261 tons. Between April 1 and September 30, 1957, they always received 259,840 tons. Of this quantity, 144,679 tons were imported while the rest was received from indigenous sources.

Remodelling Ondal Yard

The yard at Ondal is to be remodelled in the immediate future, after which it will deal with the increased production of coal in the Raniganj coalfields, expected to be 5.7 million tons at the end of the second Five-Year Plan. The increasing pressure of traffic from Calcutta passing through Ondal and also the demands of traffic originating from the third steel plant at Durgapur, 11 miles from the yard, will require the yard here to handle a little more than double the traffic it is dealing with at present.

Orange Traffic from Sikkim

During the last quarter of 1957, large quantities of oranges were moved from Sikkim to Calcutta without delays, despite transhipment necessary on the route from Darjeeling via Sakrigali Junction and Sakrigali Ghat to Calcutta, Sealdah and Howrah. The decision as to the transit arrangements

was made at a meeting in October, 1957, between the Sikkim orange merchants and the representatives of the Sikkim State Transport on the one hand and the officials of the Eastern and the North Eastern Railways on the other.

CHINA

New Construction

Some 200 km. of the Lanchow-Paotou Railway have been constructed from the Paotou end, and 87 km. from the Lanchow end. Construction of two bridges across the Yellow River has been started. The Western Line has been completed to the border of Sinkiang Province, though it is not yet open to traffic. Construction has begun of a line from Neisiang, on the Chengtu-Chungking Railway, southwards to Hsuanwei, the most northerly point on a line from Kunming. A bridge across the Yangtse will be built near Ipin.

VICTORIA

Gippsland Line Doubling

A further stage in the doubling of the main Gippsland line was reached on March 24 when double track working came into operation between Yarragon and Trafalgar, a distance of five miles. From Dandenong eastward the line is now open for double working between Dandenong and Narre Warren, Berwick and Bunyip, and Longwarry and Trafalgar. Work is proceeding on the section from Trafalgar to Moe and yards are being rearranged at Pakenham, Nar-Nar-Goon, and Drouin.

The remaining sections between Melbourne and Moe still worked as single line tracks are between Narre Warren and Berwick, and between Bunyip and Longwarry.

Camberwell-Ashburton Duplication

Work on the last stage of duplicating the Camberwell-Ashburton line, which includes the construction of a fly-over at Camberwell, is now in hand. Duplication of this line was authorised in 1951; progress of work suffered from the 1952 recession, subsequent shortages of material, and curtailment of loan funds in 1955 and 1956.

So far the doubling has been brought into service between Riversdale and Ashburton. Between Camberwell and Riversdale a fly-over is being built to carry the down Ashburton track over the Box Hill line.

Attracting Motorists to Rail Travel

A campaign to attract motorists to the railways has been launched. A pamphlet has been published which begins with the question: "What café owner would eat out? That would be bad business. You own the railways. Do you use them as much as you can?"

The Victorian Railways claim that 80 per cent of their suburban trains arrive within 2 min. of booked time; in contrast, it is pointed out that a recent check of motorists driving into Melbourne each morning showed that one driver was stopped 25 times, another 21, a third on 24 occasions, and a fourth was held up by 26 sets of traffic lights.

NEW ZEALAND

Staff Shortage

The employer with the longest list of notified vacancies in New Zealand is the Railways Department, which recently had 2,330 unfilled jobs, 44 per cent of the total notified vacancies for men disclosed by a survey of the national employment position.

The railways' total of vacancies, nearly 9 per cent of their complete staff, based on the number of staff required for the service to work a 40-hr. five-day week. The greatest shortage is of tradesmen, mainly in the building, engineering, and electrical trades. In this group the Railways Department has been 750 men short. There has also been a shortage of 630 unskilled and semi-skilled workers: 430 guards, shunters, signalmen, and station agents; 300 drivers, locomotive assistants, and trainees; and 220 track staff. The shortage persists. The total staff of the Department is over 26,000.

CANADA

Reconstruction of Calgary Station

Remodelling work has now been in progress for nearly two years at the Canadian Pacific Railway station at Calgary, at a cost of about £900,000. It is mainly directed towards improving traffic movements and facilities for the circulation, detraining and entraining of passengers. As it was all carried out under traffic, some £21,400 had to be spent on providing interim temporary trackwork and passenger facilities during the construction period.

The eight tracks of shorter length serving the platforms have been replaced by seven more-widely-spaced and capable of accommodating the longer trains now running. Between each of these tracks is a full-length concrete platform—with one exception—reached from its neighbours and from the station buildings by a 200-ft.-long subway; there is also a 220-ft., 7-ft. dia., service subway for steam, water and air mains. Goods traffic is now completely isolated from the passenger roads.

A feature of the work carried out was the provision of new subsoil foundations for the platforms and tracks that is not susceptible to frost

movement. To this end some 50,000 cu. yd. of old fill was removed and replaced by a new back-fill with an upper layer of special gravel. The whole area is floodlit.

Over five miles of track were rebuilt and 50 of the 60 power-worked points were connected up to the main control centre. The central control tower cost over £20,000 and houses more than £90,000-worth of signalling and interlocking equipment; there are 68 signals of the searchlight type in the installation. The work is now nearing completion and will be worthy of the growing city it serves.

UNITED STATES

Rail-Grinding Train

The New York City Transit System is placing in service a rail-grinding train and two diesel locomotives to haul it. The train consists of 16 grinding wagons, each equipped with six rotary grinders, three on each rail. The grinders are driven by a power plant mounted on a flat wagon.

The train will cover the whole electrified system twice a year,

travelling at 2 m.p.h. It cost \$326,662, and the diesel locomotives \$225,000! but the resultant economies in maintenance and rail are expected to amount to \$600,000 a year. In addition, grinding will afford smoother running and hence greater comfort for passengers.

The train has been purchased from the Speno Railroad Ballast Cleaning Co. Inc., of Ithaca, and the locomotives from the General Electric Company.

ARGENTINA

Strike Action

Partial strikes, increasing progressively in duration, and involving all the railways of the country, were called by the two railwaymen's unions in March, in support of a general increase of 500 pesos monthly to all grades. After several days of discussion the strikes were settled on the basis of a 400 pesos increase with negotiations on other points to continue. Several sections of the unions, however, refused to return to work even after the signing of the agreement. This occurred principally in the fruit growing districts of southern Buenos Aires and Rio Negro with the

result that large quantities of fruit were lost through lack of transport.

In a statement issued by the Ministry of Transport, it was pointed out that the latest increases in salaries and wages would cost 1,600 million pesos a year, which would have to be added to the expected deficit of 3,200 million pesos in 1958. A further increase in rates and charges could not be envisaged at the moment and therefore the whole weight would fall on the National Treasury.

FRANCE

Lourdes Centenary Year

The celebration of the Lourdes centenary year is expected to lead to record pilgrim traffics to this shrine in 1958. The celebrations were inaugurated on February 11 and already, at that time, arrangements were in hand to operate 975 special trains to Lourdes. Other trains are being booked daily, and it is estimated that by the end of the year some 1,100 trains will have been run during the 10 months of the celebrations. In addition, it is believed that some 1,500,000-2,000,000 pilgrims will travel to Lourdes by timetabled trains.

Publications Received

Metal Industry Handbook and Directory, 1958. London: Iliffe & Sons Ltd., Dorset House, Stamford Street, S.E.1. 8½ in. by 6 in. 544 pp. Price 15s.—This source of reference of the non-ferrous metal industries is now in its 47th year of publication. Besides up-to-date information on the properties of the various metals, an extensive section devoted to summaries of British Standard Aircraft Material, D.T.D., and Admiralty specifications is again included. A wide range of producers, stockists and factors of all basic metal products, metal working machinery and tools, and metal finishing equipment is listed in the directory for buyers. The handbook also includes a section on the chief metal finishing processes and data regarding all the common rod, bar, sheet and strip products.

Casting in Steel. London: Sir Isaac Pitman & Sons Ltd., 39, Parker Street, W.C.2. 9 in. x 6 in. 112 pp. Price 18s.—This book, published on behalf of the British Steel Founders' Association, supplies information about the process of casting steel in component form to make the best and most economical use of this flexible method of manufacturing a steel part. The publication has developed from a series of technical booklets produced over the last 10 years by the Association; these have been revised and amalgamated into this volume with regard to current practice. All the various operations involved in the commercial production of a casting are covered in the book which is well illustrated by diagrams and half-tone reproductions. A summary of the relative British standards for steel cast-

ings, with a glossary of steel foundry terms are also appended.

Lexique Général des Termes Ferroviaires (General Dictionary of Railway Terms). Berne-Bümpliz, Switzerland: Benteli S.A. 8½ in. x 5½ in. 829 pp. Price Swiss francs 25.—This dictionary in five languages is the subject of editorial comment on page 470. The first part consists of a general list of equivalent terms in English, French, German, Italian, Spanish, and the second of alphabetical indexes in each of the four languages other than French. The general list has been drawn up in the alphabetical order of the various terms in French, thereby avoiding the need to provide an index in that language. The French term is followed by the translation into the other four languages, all shown on one line, which is given a serial number. Given a French term for which the equivalent is sought in English, German, Italian, or Spanish, it is necessary only to consult the general list. Given an English, German, Italian, or Spanish term, when it is desired to find the equivalent in one of the other four languages, it is sufficient to consult the index covering the language in which the term is expressed to find the number(s) shown against each term in the corresponding line(s) of the general list. The dictionary was compiled by the International Documentation Bureau of the International Union of Railways (U.I.C.). Monsieur Louis Armand, President of the U.I.C., contributes a foreword.

Vulcan Magazine.—The tenth birthday issue of the *Vulcan Magazine*, the house journal of the Vulcan Foundry Limited, of Newton-le-Willows, Lancs., contains,

besides the usual personal and social features and descriptions of the firm's products, two items concerned with the changeover from steam to diesel traction in many parts of the world; one of these is a note on the last steam locomotive boiler to be produced at the works, and the other, a coloured plate of a Type "1" 1,000-h.p. diesel-electric Bo-Bo locomotive for the London Midland Region.

Map of East African Railways & Harbours.—A new map showing the rail, road, and inland marine services of the East African Railways & Harbours has been produced and is currently being distributed for display throughout East Africa and at travel agents throughout the world. The scale is 50 miles to 1 in. The map is printed in six colours, and shows all official stations and harbours on the system. It is obtainable on request from the Public Relations Office, E.A.R.&H., P.O. Box 30121, Nairobi, Kenya Colony.

French Railways Travel Literature.—French National Railways travel literature issued for the 1958 season includes a variety of brochures and folders in English, also maps, all of a high standard of production. This and other material is obtainable free from S.N.C.F. offices and travel agents, including French Railways, Limited, 179, Piccadilly, London, W.1. The booklet "France," issued yearly, contains a new selection of illustrations in colour and monochrome. The folders dealing each with a tourist region of France appear again, also with fresh illustrations. Other folders are devoted to the Boulogne-Lyons car/sleeper express and to the motorcar ferry *Compiègne*.

Design and Improvement of Diesel Trains

Review of technical aspects of railcars and multiple-unit sets.

ONE of the subjects to be considered by the International Railway Congress Association at its Madrid meeting later this year, is concerned with design and improvements of diesel railcars and multiple-unit trains. The subject, which is Question 3 on the agenda, is particularly concerned with the operation of various types of diesel trains, traction power equipment, body and bogie construction trends, weight reduction, sound-proofing, air conditioning, and buffering and traction gear.

Dr. Ing. G. A. Gaebler, of the Headquarters of the German Federal Railway, is the reporter for the English-speaking countries, those with British associations, or where British practices largely prevail. His report is based on information submitted by the following administrations: British Railways, German Federal Railway, Coras Iompair Eireann, Japanese National Railways, New Zealand Government Railways, Norwegian State Railways, and Swedish State Railways.

Railcar Design Trends

Railcars built and put into service in the post-war period are almost exclusively designed to be used for passenger transportation. This is shown by replies concerning rail-cars built between January 1, 1946, and January 1, 1957, under construction or design. The Swedish State Railways alone report having a railcar type for narrow gauge lines designed for use in freight traffic, of which four units are in service.

Passenger services ensured by diesel rail-cars cover a very wide field, having at the one extremity the very smallest units employed for stopping services on secondary lines, and very powerful multiple-unit sets worked in long-distance services and as luxury trains on main lines, at the other.

Commensurate with this operating programme and influenced by the variable requirements as they exist in the various countries and to which the railcars must conform, a multitude of types has been developed, frequently differing considerably in engineering features amongst each other.

There exist simple four-wheel vehicles with a maximum speed of 70 km. per hr. (40 m.p.h.) and a 60-h.p. engine, which are used without either trailer or control trailer. Commencing with a power output of approximately 125 h.p. such vehicles are already put into service coupled to a trailer or control trailer; where they are of light construction, similar more or less to that of road buses, they are capable of an acceleration of up to 90 km. per hr. (55 m.p.h.). Depending on the composition of such trains, anywhere from 60 to 280 seats, plus additional space for luggage, can thus be made available. Designs of the intermediate class, with

an overall power output of 400-500 h.p., supplied either by a single engine or by two smaller engines, are most generally put into service jointly with trailers and control trailers, respectively. Their design predominantly embodies bogies, and they usually have first class accommodation and also a restaurant service, while frequently gangways between units are incorporated. Their field of application includes stopping services, regional services, and also fast services on main as well as on secondary lines. Maximum speeds are in the vicinity of 120 km. per hr.

High-capacity designs are invariably multiple-unit sets with maximum speeds of up to 140 km. per hr. (85 m.p.h.) and a built-in power supply of up to 2,200 h.p. available in two engines of 1,100 h.p. each. They are chiefly used on main lines as luxury trains or in long-distance express service, but to some extent also in ordinary express service. They differ amongst each other not only as regards the interior layout aided by structural features, but also in their riding qualities and supplementary facilities intended to improve the passenger's comfort.

Standardisation

On the question of the standardisation of railcars and their associated equipment, the majority of the administrations are endeavouring to achieve this by limiting the number of classes of railcars and engines. British Railways note specifically that it is the intention to keep to a standard range of units for: (a) cross-country and branch lines (b) suburban or cross-country service; (c) fast inter-city service.

On the basis of data made available, the railcars of British Railways may be subdivided in the following groups.

The type in group 1, four-wheel railbuses, is predominantly used in short-haul traffic and corresponds therefore to the purpose listed under (a) for cross-country service and on branch lines.

The types in group 2, standard bogie railcars, are, depending on the composition of trains of motor-coaches, trailers, and control trailers, partly used in cross-country and short-haul traffic, but partly also in express and other rapid services.

The type in group 3, the Southern Region diesel-electric trains, is used exclusively in fast inter-city service.

The Japanese National Railways own a large number of types arranged in standard types by groups. The total comprises eight standard types, six of which are predominantly used in cross-country and short-haul traffic, whilst the remaining two are used for rapid services.

The German Federal Railway distinguishes for utilisation services between

(a) regional and short-haul traffic; (b) rapid service; (c) long-haul rapid service and TEE services.

The answers to the questionnaire shows that each railway has used every possibility to standardise on engines and other mechanical equipment for this class of vehicle. This is shown by the use of the same engine and transmission equipment in many British Railways railcars; by the Japanese National Railways in 19 types of their railcars; and by the German Federal Railway in their railcar sets VT 08.5, VT 11.5, and VT 12.5.

Duplicate Power Units

Dealing with motor power equipment (engine and transmission), the report shows that the railways of the Irish Republic, Norway, Japan, Great Britain, and Western Germany have equipped part of their railcar stock with power and transmission in duplicate.

The Japanese National Railways provide their standard type KIHA 51 and 55 with two engines in order to improve acceleration on hilly sections and on lines with high density of traffic and to enable the addition of a trailer on lines near large cities, if passenger demand makes this necessary.

The choice of the number of engines will be determined by the overall of installed power required and size of engines available on the market. A further determining factor is the positioning of engine. If underfloor positioning is selected, the installation of two smaller engines of lower power will frequently be unavoidable.

The German Federal Railway states that the choice of two, and in some cases even more, engines taken from serial production in the motor vehicle industry may easily be less expensive than a single large unit chosen from the general engine manufacturing programme.

Lower Maintenance Cost

So far as maintenance costs are concerned, however, both the Japanese National Railways and the German Federal Railway are of the opinion that a single large engine will prove less costly to maintain. Thorough investigations carried out by the Workshop Service of the latter have shown beyond doubt that maintenance costs are in a definite relation to number of cylinders and much less so to the size of cylinders.

Referring to the use of two- or four-stroke engines the railways, in their railcars, have up to now used four-stroke engines exclusively, as this is the type of construction available on the market in far greater number than the two-stroke engines at least as regards British Railways. The Swedish State Railways believes that the question of two- or four-stroke engines is

less important, so long as products of well-known manufacturers are used. Relative to the engine speed, the answers to the questionnaire show that engines with a speed of from 1,500 to 2,000 r.p.m. are generally preferred. Because fast engines have a high specific power output, they are generally preferred to slow engines in railcar construction, taking into consideration the lack of space prevailing in these vehicles.

The question of possible advantages due to lower weight, lower first cost and, consequently, lower operating expenses was not dealt with in the replies to the questionnaire.

Pressure-Charging

The application of pressure-charging, to raise the specific power output has been used up to now on engines of a rating in excess of 200 h.p. by the railways in Germany, Sweden, Norway, and this country, by the latter with an experimental railcar and with the Southern Region diesel-electric sets. The power output boost obtained with pressure-charging varies between 25 and 58·8 per cent. The German Federal Railway also applied pressure-charging to engines of a lower rating, 135 h.p., the rate of charging being intentionally held below standard, with a power output gain of approximately 15 per cent. It is, however, intended to discontinue pressure-charging engines of such low rating as a worthwhile gain does not seem to be obtainable until the higher output ratings are reached.

Power Unit Location

The motor equipment of railcars may be installed in the body; suspended underneath the body; or on the bogie (projecting partly into the body).

The specific positioning of the engine, a question which has to be decided early at the designing and construction stage, depends to a very large extent on the general plan of arrangement, the size and power of the engine, and the choice of engine type and number; so far as the latter are concerned, the size of the engine will also be influenced by its speed.

All railways consulted, with the exception of the Swedish State Railways, use the underfloor engine with an engine rating of 240 h.p. and less. The upper output limit with this arrangement should at present be in the neighbourhood of 450 h.p., a rate up to which suitable engines are now available; the advantage is that with the same train length more space can thus be reserved for passengers. The opinion is also given that the ease of maintenance and removal is also a decided advantage.

The engines of long-haul fast diesel trains of the Norwegian State Railways and the German Federal Railway are positioned on the bogie; this permits the utilisation of engines with vertical cylinders, either in line or with V-type cylinder banks, in particular with higher power ratings. As the engine projects into the body, it is easily accessible from above.

The maximum power available in an

engine installed on the bogie, known to the reporter at present, is 1,100 h.p.

The replacement of engines mounted in this manner may be either by means of a bogie drop stage or by lifting the body high enough to clear the engine. It is obvious that in this case the locally required installations represent a greater outlay of money.

By arranging the mechanical equipment in the forward section of the railcar, it is likely to be less difficult to protect space reserved for passenger accommodations against engine noise and vibration.

In the opinion of the German Federal Railway, it is preferable to install engines with a high power rating in a special engine room in the body. This facilitates the supervision of the proper function of the diesel engine and its auxiliary equipment by the train crew and increases accessibility. Moreover, the diesel engine and the auxiliary equipment are thus better protected against vibration, dirt and other injurious influences. The engine room can also be more adequately sound-proofed and ventilated. The replacement of structural components must in this case be effected by lifting devices through a suitably provided opening in the roof.

Transmission Systems

The railway administration were also asked to state what system of transmission they stipulate according to the power of the railcar or, if the case arises, according to its category for a given power, and the reasons for the choice.

The replies showed that mechanical, hydro-mechanical, or outright hydraulic systems are preferred, the upper limit of application of the purely mechanical transmission being at present slightly in excess of 200 h.p., whilst the field of the high-powered railcars has been reserved to the hydraulic and hydro-mechanical transmissions, respectively. The electric transmission is represented in type Southern Region type and type KIHA 09 of the Japanese National Railways.

British Railways consider it premature to pass judgment on the relative merits of the various systems.

Reasons cited by the administrations of Norway, Sweden, Japan, and West Germany for their preference of the mechanical and hydraulic transmission and combinations of the two, respectively, over the electric transmission are to the effect that the former are more

advantageous in respect of weight and price. The Norwegian State Railways emphasize the fact that the efficiency of the hydraulic transmission is not inferior to that of other systems.

In low-power railcars the railways of Sweden, Great Britain, West Germany, and Japan utilise the mechanical transmission, which is easy to build and therefore less expensive, partly because the whole transmission or certain component parts are easily obtained out of current production in the motor vehicle industry.

The operating efficiency of the mechanical transmission, even under severe climatic conditions, as for instance in Norway, is stressed.

The Japanese National Railways, who in their railcar type KIHA 09 utilised the electric transmission, abandoned this type of transmission after a trial period, utilising now uniformly the hydraulic transmission in all railcars. Half the number of their railcars with electric transmission was refitted with the hydraulic transmission.

The Swedish State Railways mention the utilisation of a transmission, type Lysholm-Smith, i.e., a hydraulic transmission with a speed range from 0-40 km. per hr. (25 m.p.h.). At speeds in excess of this, the engine crankshaft is connected directly to the driving axle. Considering that the acceleration at the lower speed range was unsatisfactory, the railcars are now being equipped with a hydraulic coupling and a mechanical four-speed gearbox.

Arrangements for driving the axles, in the case of mechanical and hydraulic transmissions, include both bevel and spur gears, straight toothed and spiral or helical toothed. The German Federal Railway considers that 500 h.p. is the maximum power that can be transmitted to a single axle.

Power : Weight Ratios

In the table, a comparison has been made between values indicated by the administrations as most desirable and those actually attained in standard sets (h.p. per ton).

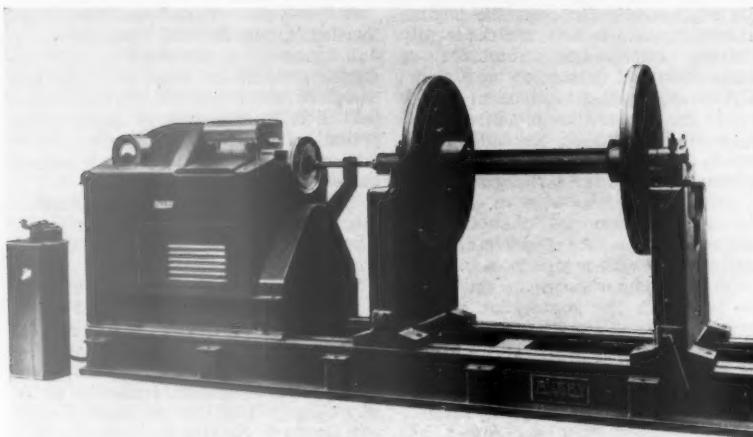
The value of "installed power/total weight of set" is derived from data submitted. "Total weight of set" includes weight of passengers, estimated at a rate of 75 kg. (165 lb.) each, based on the number of seating accommodations available. The weight of passengers using standing room, luggage, and mail has not been considered. The "installed power" assumed is the full rated power of the engines

SUMMARY OF POWER : WEIGHT RATIOS FOR RAILCARS

Country	Ratios recommended by the railways				Actual ratios of standard sets
	For hilly country	For level country	For medium speeds	For high speeds	
Great Britain ..	8 (min.)	6 (min.)	6 (min.)	8 (min.)	4·2-9·8
Irish Republic ..	—	6	7	8 to 10	4·4
Japan ..	6 to 8	5 to 6	5 to 6	6 to 8	3·8-8·0
New Zealand ..	—	—	—	—	6·9
Norway ..	—	—	10	—	8·2-10·7
Sweden ..	8	—	6·3	8 to 11	4·4-4·7
West Germany ..	8	6 to 8	6	8	6·3-10·2

Electrodynamic Balancing of Wheel Sets

Correction of dynamic unbalance



Electrodynamic balancing machine as arranged for wheel sets

THE increasing attention now given to the design and production of more comfortable rolling stock has focussed interest on the use of methods and materials which reduce vibration. A major contribution to the solution of this problem is satisfactory dynamic balancing of the running gear.

It is claimed by the manufacturer that the Avery electrodynamic balancing machine offers many advantages. The basic machine is well known to the makers of engines, gearing, and electrical equipment. Its use is now to be extended to the balancing of wheel sets. The principal advantages are stated to be that a relatively unskilled operator can quickly and accurately determine the position and amount of correction required; and that good sensitivity is obtained without having to use delicate mechanical or electronic amplifiers.

It is impossible either to identify or to correct an out-of-balance wheel set without a dynamic test, because of the distance between the two main masses. A roll test can indicate static balance only. If the static balance is produced by the cancelling effect of opposite out-of-balance conditions in each wheel, then a swivelling force or couple will be produced when the wheels are rotated.

Main Features of Machine

The balancing machine consists of a heavy base on which are mounted two adjustable pedestals and a driving head. On the top of the driving head is fitted the indicating head; this contains a wattmeter, four-position switch, sensitivity switch, plane potentiometers, calibration controls, and polarity switches. The driving head contains in a ventilated housing, on the 7208 model, a 5-h.p., 415-V. three-phase slip-ring motor running at 1,460 r.p.m. This drives the main shaft through vee

belt at 600 r.p.m. On the 7209 model, a 10-h.p. motor running at 740 r.p.m. drives the main shaft at 500 r.p.m.

The drum controller for accelerating the rotor is provided with a reverse position for "plug" braking. Also fitted in the driving head is the two-phase alternator, which is direct coupled to the drive shaft. In finding the angular position of the unbalanced mass, the stator of this alternator is turned by a worm-drive handle on the front of the machine.

The wheel set is mounted in two open roller bearings carried on bridge pieces, which are free to move laterally against

a light spring load. The wheels are rotated at the test speed by a universal-jointed shaft from the drive motor. The bridge pieces are mechanically connected by a rod to a small moving coil which vibrates in the field of a permanent magnet. Alternating current produced by the moving coil is fed into a centre-zero wattmeter; the fixed coil of the latter is supplied with current by an alternator rotating at the same speed as the wheel drive shaft. The phase relationship of this alternator in regard to the test rotor can be changed by switching and by the partial rotation of the stator.

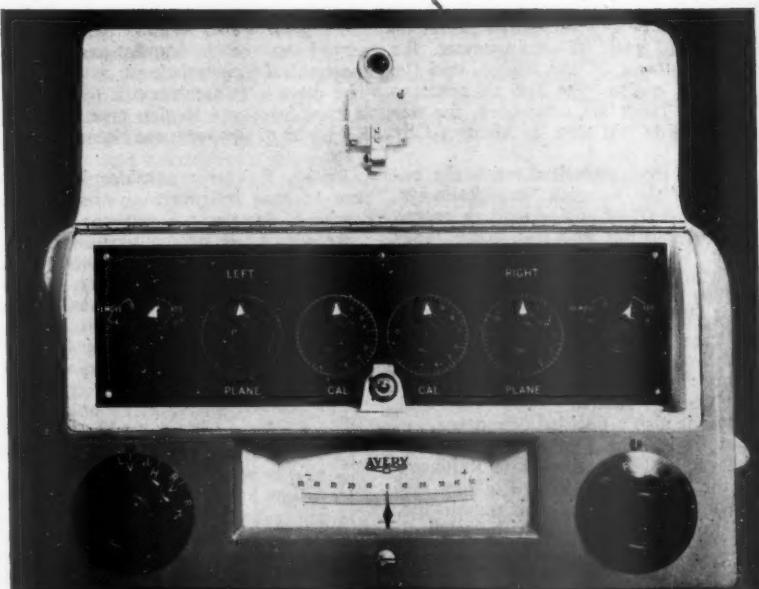
Wattmeter Reading

As shown above, the reading on the wattmeter is the product of the current in the two coils. As the current supplied by the rotating alternator is a fixed amount, the wattmeter reading will show the amount and phase relationship of the current supplied by the vibration pick-up.

The alternator is a two-phase machine, the phases being at 90 deg., so that by adjustment of the stator the meter reading can be brought to zero. By switching to the other phase, without disturbing the previous setting, the maximum amount of unbalance can be read on the meter. The angular position of the unbalanced force is indicated by the protractor, which shows how much the stator has been turned when zeroing the meter.

Besides the conventional method of

(Continued on page 483)



Indicating head with setting control cover lifted. On the left of the wattmeter is the four-position selector switch

Type "4" Diesel-Electric Locomotives for British Railways

First of 10 English Electric 2,000 b.h.p. 1-Co-Co-1 units delivered



British Railways Type "4" 2,000-b.h.p. diesel-electric locomotive built by the English Electric Co. Ltd.; ten of these are to work express passenger trains in the Eastern Region

THE first of 10 2,000 b.h.p. main-line diesel-electric locomotives ordered by the British Transport Commission from the English Electric Co. Ltd. has been completed and delivered to the Eastern Region of British Railways. The wheel arrangement is 1-Co-Co-1. The equipment is based on that of the first five main-line diesel-electric locomotives to go into service on British Railways. These were the two 1,600 b.h.p. diesel locomotives built in 1947 by the former L.M.S.R., and two of 1,600 and one of 1,750 b.h.p., built in 1951 and 1954 respectively to the requirements of the Southern Region. In all cases the mechanical parts for the locomotives were built in British Railways workshops; the new locomotives, however, are being completed at the works of the English Electric associated

company the Vulcan Foundry Limited, at Newton-le-Willows, Lancs.

The locomotive is intended primarily as a passenger unit; multiple-unit operation is possible with many of various types under construction by British Railways and other manufacturers.

Leading particulars are as follow:—

	ft.	in.
Length over buffers	69	6
Overall width	9	0
Overall height	12	10
Bogie wheelbase, total	21	6
Bogie wheelbase, rigid	16	0
Wheel dia., Pony truck	9	0
Driving	3	9
Weight in working order	133	tons
Adhesive weight	108	tons
Maximum axle load	18	tons
Maximum tractive effort	52,000	lb.
Continuous tractive effort	30,900	lb.
Maximum service speed	90	m.p.h.
Engine fuel tank capacity	700	gal.
Minimum curve negotiable	300	ft. rad.

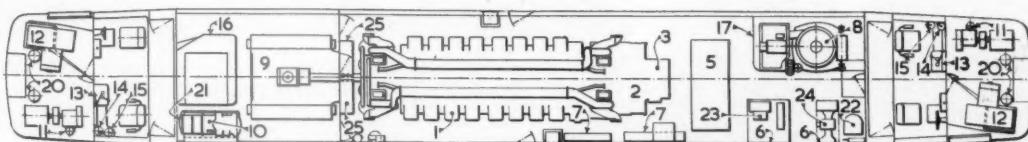
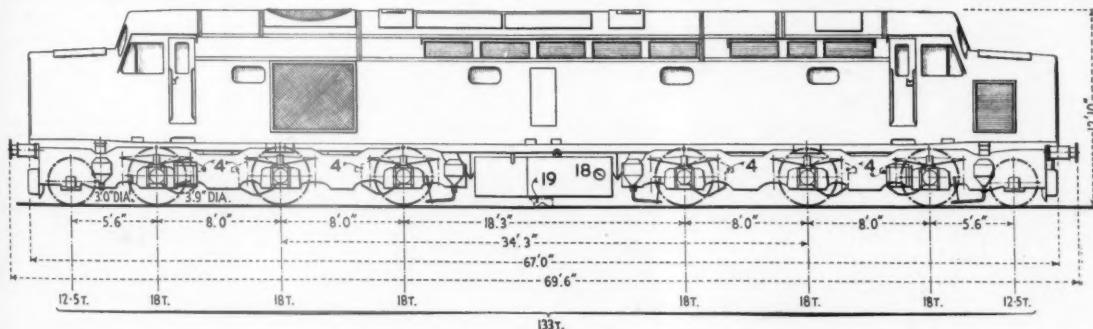
The general arrangement and layout

of equipment can be seen in the accompanying diagrams.

The locomotive is powered by an English Electric 16 SVT Mark II diesel engine rated at 2,000 b.h.p. at 850 r.p.m. This is a 16-cylinder four-stroke V-type unit pressure-charged by four Napier exhaust-gas turbo-chargers.

The main generator is bolted up to the engine with the auxiliary generator overhung from the main generator, the complete unit supported on resilient bearers to avoid normal flexing of the locomotive underframe causing stresses in the power unit.

Engine lubricating oil and cooling water are passed through a double-bank radiator, one radiator panel being mounted at each side of the locomotive. Air is drawn across the radiators by the radiator fan and is then expelled



General arrangement and layout of Type "4" diesel-electric locomotive

through the locomotive roof. The fan is driven by an extension shaft from the free end of the engine. Cooling water temperature is controlled by a thermostatic by-pass valve and shutters, controlled from the cab, are provided on the radiators as protection against frost.

Main Generator

The main generator is a d.c., self-ventilated, single-bearing machine with a continuous rating of 1,800 A. at 730 V. In addition to a separately excited winding which is used for normal running, it is provided with a series winding which is connected across the battery for engine starting.

The overhung auxiliary generator is also a direct current, self-ventilated machine with the output voltage maintained constant at 110 V. by a carbon pile voltage regulator. This output provides the low tension supply for battery charging, operating the control gear and driving the compressor, exhausters and traction motor blowers.

Traction Motors

Six traction motors are mounted, one on each of the main bogie axles, of the axle-hung nose suspended type. They are d.c., series-wound machines driving through single-reduction spur gearing. The rating (continuous) is 600 A. at a nominal 300 V. Provision is made for weakening the field strength of the traction motors by field divert resistances.

Three motors on each bogie are force-ventilated from a blower mounted in the adjacent nose-end compartment of the superstructure, the air being led by ducts and flexible bellows connec-

tions to the air inlet at the commutator end of the motor.

The main auxiliaries consist of two Northey Boyce 125 RE exhausters, a Westinghouse DVC3 compressor, two Keith Blackman traction motor blowers, a C.A.V. fuel supply pump and a lubricating oil priming pump, all of which are motor driven from the 110 V. d.c. supply.

The two-speed exhausters are mounted one in each nose end compartment and create vacuum for operating the train brakes.

The compressor is mounted adjacent to the fuel tank and provides compressed air for operating the locomotive brakes, control gear, sanders and warning horns.

The traction motor blowers are direct driven centrifugal fans driving air through filters in the side of the nose compartment.

The fuel pump is mounted near the engine at the radiator end and supplies fuel under slight pressure to the engine bus rails. In the unlikely event of a failure of this unit provision is made for gravity fuel supply for a limited period. The lubricating oil priming pump is driven from the battery and is arranged to deliver the initial supply of lubricating oil before the engine is started.

Control Gear

The majority of the control gear is housed in a cubicle located transversely across the locomotive at the generator end of the main compartment. The remainder consists of two power controllers and two reversing switches, one in each driving cab, and a torque regulator and voltage regulator

mounted above the batteries adjacent to the main equipment cubicle.

The traction motors are connected across the main generator in pairs in series, the three pairs being connected in permanent parallel. Their fields are arranged for field weakening in three stages which occur simultaneously on all motors. This is automatically introduced by the torque regulator and again is automatically suspended when engine loading becomes excessive.

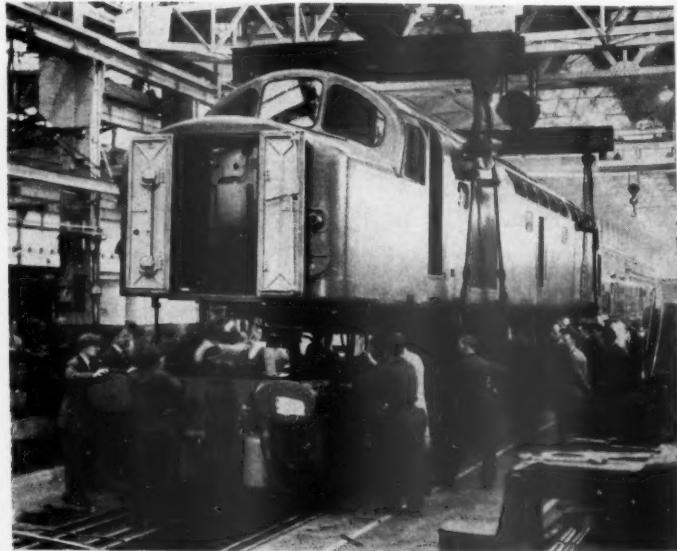
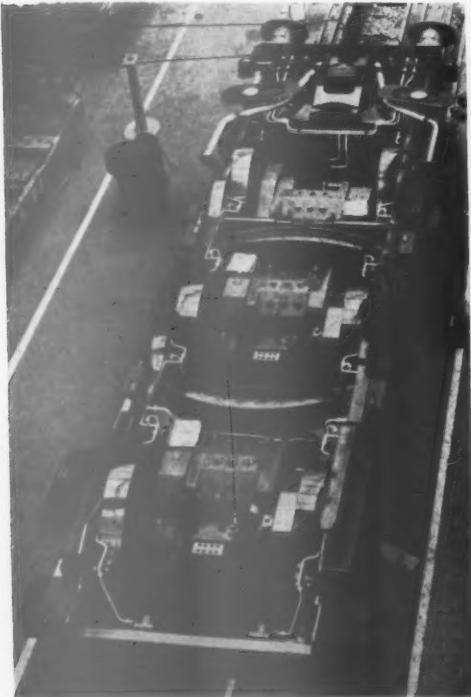
The power controller and reversing switch are mounted together in a pedestal at each driving position; the two are mechanically interlocked to prevent incorrect operation and the controller handle can only be moved after being released by a special key.

Wheel Slip Protection

Wheel slip protection circuits are included which automatically reduce the tractive effort should this condition occur and also illuminate a warning light at each driving position.

Additional warning lights are provided to indicate diesel engine shutdown, traction motor blower failure, or high engine cooling water temperature. On the assistant's side of the cab, another light shows should the train heating boiler shut down.

Operation of the controller in the cab from which the locomotive is being driven energises circuits through the manufacturer's standard control electro-pneumatic and electro-magnetic equipment. The engine speed is continuously varied from 450 r.p.m. to 850 r.p.m. and the loading is automatically adjusted so that the engine delivers the maximum power corresponding to the selected engine speed.



Above: Lowering body on to bogies at the Vulcan Foundry works erecting shop; note arrangement of front end

Left: Layout of bogie, showing arrangement of traction motors, segmental pivot bearings and side buffers

The locomotive has a full-width superstructure which is divided into six compartments. At each end there is a driving cab located behind the nose-end compartment while the centre section is divided into the engine and radiator compartments. Close fitting doors are provided giving access from the driving cabs through all compartments, and entrance doors are provided on each side of the two driving cabs and the engine compartment. Hatches are also provided in the side of the locomotive to improve accessibility of certain equipment; roof hatches and removable roof sections permit major items of equipment to be lifted out when necessary.

The locomotive underframe and body is formed of rolled steel sections welded to form a single stressed unit and follows the manufacturer's current practice. The engine fuel tank is located in the radiator compartment, the space between the bogies being used for underslung tanks carrying water for the train heating boiler. This water tank can be refilled from water troughs, for which purpose a scoop is fitted, or from steam locomotive water cranes, or by means of a standard hose connection.

Bogies

The bogie is very similar to that of the diesel-electric locomotives originally built by the Southern Region, which were described in our issues of March 9, 1951, and May 28, 1954. It consists of plate side frames riveted to rigid cross stretchers, the middle two of which carry the segmental pivot bearings. The dragbox is built into the bogie frame and carries two spring loaded side

bearers; British Railways standard buffers and drawgear are bogie mounted. The left-hand illustration on the opposite page shows the layout of the bogie.

The end axle of the bogie is in the form of a pony truck with short control links carried ahead of the axle and anchored to the buffer beam. All axleboxes are Timken taper roller bearings with a cannon-type box on the truck. All springing is applied direct to the axleboxes and consists of a pair of reverse camber laminated springs to each motored axle with auxiliary coil springs on each link.

Each driving wheel is fitted with two brake blocks, each block being operated by an individual air brake cylinder. Sanding is provided from sandboxes located at the four corners of the group of driving axles; the leading driving wheels in each bogie being sanded.

Brake Gear

The locomotive brakes are operated by compressed air; two driver's brake handles are provided at each end, one for operating the locomotive air brakes only, the other applying the vacuum brakes of the train and the locomotive air brakes through a proportional valve. A hand brake operating on the adjacent bogie is also provided in each driving cab. A deadman's foot-operated pedal is provided.

Each of the nose-end compartments which are identical, houses a traction motor blower, an exhauster, the gangway connection for access to another locomotive when working in multiple and two carbon dioxide bottles for the fixed fire extinguishing equipment. Should the automatic fire alarm sound,

the gas from the bottles may be released in the engine compartment by operating a pull handle in the driver's cab. Hand fire extinguishers are also provided for dealing with small fires.

The driving compartments have three large fixed windows for forward view and drop lights at the sides. The driving controls are arranged as follow:—At the driver's left are the air and vacuum brake valves, to the right the master controller and reversing switch; the driving instruments and warning lights are arranged in a neat panel between the two. On the assistant's (right hand) side of the cab are the hand brake wheel, water scoop controls, boiler indicator light and the operating handle for the Walter Kidde fixed fire extinguisher equipment.

The main compartment houses beside the power unit and main control equipment frame, the D.P. batteries and the 2,700-lb. per hr. Stone-Vapour steam generator, a single-pass fully automatic water tube type of train heating boiler. Toilet and simple cooking facilities are also provided on the locomotive.

Subcontractors for the locomotives include:—

Locomotive air brake equipment	Westinghouse Brake & Signal Co. Ltd.
Vacuum exhausters	Northey Rotary Compressors Limited
Axleboxes	British Timken Limited
Seats	A. W. Chapman Limited
Train heating boiler	J. Stone & Co. (Deptford) Ltd.
Fuel injection equipment	C.A.V. Limited
Windscreen wipers	Trico-Folberth Limited
Traction motor blower fans	Keith Blackman Limited
Batteries	D.P. Battery Co. Ltd.
Fire extinguisher equipment	Walter Kidde Co. Ltd.
Voltage regulator	Newton Bros. (Derby) Ltd.
Radiators	Spiral Tube & Components Co. Ltd.
Pressure chargers	D. Napier & Son Ltd.

Electrodynamic Balancing of Wheel Sets

(Concluded from page 480)

adding or removing weight from a single position determined during testing, a two-point method can be used. This enables the position of two points, 90 deg. apart, to be selected for balance adjustment before the wheels are placed on the machine.

By using the four-position selector switch on the indicating head a reading is obtained on the wattmeter, which shows the amount of weight to be added or removed from the two selected positions on each wheel.

The arrangement of the indicating head is shown in the lower illustration on page 480.

Plane Setting

Although the amount of correction required on a wheel set is measured fairly close to the longitudinal position or plane in which the correction will be made, a control is provided to ensure that the true correction figure is shown on the wattmeter.

This preliminary adjustment, known as plane setting, only requires to be carried out when the machine is first set up for a batch of similar wheels. The method used is, by potentiometer

control, to combine in the correct proportions the output of the two pickups. This also ensures that unbalance in one wheel does not affect the reading on the other.

RAIL-ROVER TICKETS IN THE SOUTHERN REGION.—The rail-rover tickets introduced for a trial period last summer in the Southern Region of British Railways are available again this year but at a lower price. The tickets, which will be issued until October 26, cost 8s. 6d. instead of 10s. They will also be issued on Saturdays instead of only on Sundays. These rail-rover tickets are sold for three country areas near London and the holder has unlimited travel by any train within the area for which the ticket is available on the day of issue.

THIRD PROTOTYPE "ALUMINIUM" TUBE TRAIN FOR L.T.E.—The third prototype tube train went into service on the Piccadilly Line of the London Transport Executive on April 14. Built by the Birmingham Railway Carriage & Wagon Co. Ltd., the train is like the other prototypes in that it has its seven cars panelled in unpainted aluminium alloy. There is a saving of about half a ton in the weight of each car compared with the standard coaches. There is also a saving in painting costs and maintenance, as well as in traction current consumed. The use of

underfloor equipment on these trains increases the carrying capacity compared with most of the stock at present in use on the Piccadilly Line. Rubber springing is used for the bogie bolster and axlebox suspension and another feature is the fitting of fluorescent lighting.

CAR/SLEEPER TRAINS BETWEEN MIDLANDS AND SCOTLAND.—Car/sleeper trains are to run between Sutton Coldfield and Stirling this summer. They will leave Sutton Coldfield at 9.35 p.m. every Sunday and Wednesday from June 1 to August 31. The return fare for motorcar and driver will be £14 10s.; additional adults £5 each. The trains will have accommodation for 20 motorcars in covered vans and 84 passengers in second class sleeping berths. Return services from Stirling will be on Mondays and Thursdays.

IRION SIDE-OPERATING FORK LIFT TRUCKS AT EARL'S COURT.—Materials Handling Equipment (Great Britain) Limited will exhibit a comprehensive range of Irion side-operating fork lift carriers at the forthcoming Mechanical Handling Exhibition to be held at Earl's Court, London, from May 7-17. The range exhibited will include the Irion Carrier of 3-ton capacity, besides the Irion Falcon Carrier of 11,000-lb. capacity, diesel-powered, which will be exhibited for the first time at Earl's Court. Another exhibit will be the Model U.L.G. 1530 E. battery-operated carrier of 20-30 cwt. capacity.

New Station at Zamora

R.E.N.F.E. developments include a new station and new lines



Spanish National Railways new station at Zamora, the starting point of the direct route to Santiago via Orense, to be completed this year. The architecture is in a traditional Spanish style

A NEW station at Zamora, Spanish National Railways, was brought into use in December, 1957. It is part of a number of new works in connection with improved facilities in the area. The improvements were instigated some 80 years ago to put Madrid in direct communication with the Galician coast, via Medina del Campo and Zamora Orense, where the line divides for Vigo and Corunna.

A company was formed to construct the section, but only the stretch from Medina to Zamora was completed. Monforte, on the Palencia-Corunna line, was later connected through Orense with Vigo, which was also linked northwards via Pontevedra to Santiago de Compostella. The area between Zamora and Orense, on the Spanish side of the northern frontier of Portugal, was left devoid of rail communication. Corunna could be reached from the capital only by a circuitous 525-mile journey, while the distance to Vigo was 520 miles and the route even more devious.

Although the original plans were put in hand over 30 years ago, progress was slow for political and economic reasons. The northern link between Santiago and Corunna was opened in April, 1943. The first part of the new direct line

from Zamora, to Sanabria near the Portuguese frontier, followed in September, 1953. Last July, this line was continued a short distance beyond Orense and formally opened. It is expected that the final extension to Santiago, a further distance of approximately 60 miles, will be complete in July this year.

Rail Distances Reduced

The journey from Madrid via Léon, to Corunna will be shortened by 59 miles. The rail distance from the capital to Vigo, Orense or Pontevedra will be reduced by 99 miles and that to Santiago by as much as 150 miles. The engineering works involved, designed to carry a double line, are unusually heavy and numerous, because of the difficult terrain. Of the section to Carballedo (18 miles beyond Orense) opened last July, about 36 miles is in tunnel. The Pardonelo tunnel is 3½ miles in length and there are numerous high viaducts and embankments. The new stations are all of excellent appearance and specially designed to meet any expected growth of traffic. Level crossings have been avoided throughout. The diversion of a number of trains, including some expresses, to the new route has relieved the line between Léon and

Monforte. The difficult section through Ponferrada is heavily loaded with mineral traffic.

SCOTTISH REGION "ASSURED ARRIVAL" SERVICES.—British Railways, Scottish Region, reports that the assured arrival service for freight traffic introduced in the Region on April 8 has met with a quick response from traders; 3,000 consignments were conveyed without failure during the first week. The new service assures traders that goods will be available to their customers on the day following despatch.

L.M. REGION PHOTOGRAPHIC EXCURSIONS.—As a result of a successful experiment in Manchester last year, British Railways, London Midland Region, have decided to extend their arrangements for special photographic excursions this season. Prizes for the best pictures are offered to amateur photographers who travel on these special day excursions. The trains are composed of corridor vestibule coaches and a buffet car, and make special stops at suitable places to allow passengers to use their cameras. The L.M. Region programme for this season includes excursions from the Blackpool area to Knaresborough and York; from Nottingham and Mansfield to Bettws-y-Coed; and from Loughborough and Leicester to Worcester, Malvern and Hereford.

RAILWAY NEWS SECTION

PERSONAL

Sir Reginald Biddle, a Director of Taylor Woodrow (Overseas) Limited, has been elected Chairman of the Council, International Road Federation, succeeding Mr. A. R. M. Geddes, a Managing Director of the Dunlop Rubber Co. Ltd.

Mr. W. Brown, Assistant Regional Accountant, Eastern & North Eastern

Eastern Regions. He was made responsible for the general supervision of the Eastern Region Economic Survey Office on its establishment on March 1, 1957. Mr. Brown is a Chartered Secretary and holds the Brunel Medal awarded by the London School of Economics. His new appointment is a consequence of the decision to establish separate accountancy organisations for the Eastern and North Eastern Regions, British Railways.

Mr. A. G. Lyall has been appointed Private Secretary to Mr. G. R. H. Nugent, J.P., M.P., Joint Parliamentary Secretary to the Ministry of Transport & Civil Aviation. He succeeds Miss K. S. Dee.

Colonel S. H. Bingham (Retd.), Consulting Engineer, New York, is visiting Europe to confer with his associates. His itinerary includes London, Stockholm, Oslo and Paris.



Mr. W. Brown
Appointed Regional Accountant Designate,
Eastern Region, British Railways



Mr. Daniel Herlihy
Chief Engineer, C.I.E., whose position
has been enhanced

Regions, British Railways, who, as recorded in our April 4 issue, has been appointed Regional Accountant Designate, Eastern Region, joined the Chief Accountant's Department of the former London & North Eastern Railway in Manchester in 1923. He transferred to London in 1929 and obtained an L.N.E.R. Accountancy Apprenticeship in 1937, the first year of the scheme. He was appointed Assistant Secretary of the L.N.E.R. Superannuation Fund on its inception in 1939. He joined the Royal Artillery in August, 1941, and subsequently transferred to the Royal Engineers, being demobilised in May, 1946, with the rank of Captain. He was appointed Assistant Works Accountant for the North Eastern Area of the L.N.E.R. in 1946, and, in 1948, he became Assistant Regional Accountant, Scottish Region. In 1948 he was appointed Senior Assistant to the Director of Accounts, British Transport Commission Headquarters, and in December, 1950, became Assistant Regional Accountant, Eastern and North

Mr. A. V. Basu, General Manager of the South Eastern Railway of India has retired. He is succeeded by Mr. G. P. Shanani.

Mr. M. Srinivasan has been appointed Joint Secretary of the Railway Board of India. He has recently returned to that country from Washington, where, as a member of the Indian Supply Mission, he was concerned with the purchase of iron and steel from the U.S.A. and Canada for India's second Five-Year Plan.

Dr. O. M. Solandt, Vice-President, Research & Development, Canadian National Railways, and Mr. E. Wynne, Chief of Motive Power & Car Equipment of that system, have completed a tour of Europe. They made a general study of railway developments in Britain and on the Continent.

Mr. C. H. Flursheim, Chief Electrical Engineer, Metropolitan-Vickers Electrical Co. Ltd., has been appointed a Director.

Mr. Daniel Herlihy, B.E. (Civil), A.M.T.P.I., M.I.C.E.I., Chief Engineer Coras Iompair Eireann, who, under the re-organisation of that system's engineering departments, assumes responsibility for all the engineering activities of the Board, was engaged for many years in public road construction and administration. He was appointed Assistant Chief Engineering Adviser in the Department of Local Government in 1947. Mr. Herlihy became Chief Engineer, C.I.E., in February, 1951. He was responsible for permanent way, buildings and canals.

Mr. E. Black, Chief Engineer, Way & Works, Ceylon Government Railway, has been appointed Acting General Manager, from March 24, 1958, consequent on three months' leave granted to Mr. B. D. Rampala, General Manager. Mr. Rampala is expected to visit the Japanese National Railways, in April. Mr. N. A. Vaitilingam, Deputy Chief Engineer, is officiating as Chief Engineer, Way & Works.



Photo]

Mr. L. Collins

Appointed Deputy Chief Engineer (Mechanical),
Coras Iompair Eireann

*Mr. A. K. McAuley*

Appointed Deputy Chief Engineer (Road Rolling Stock), Coras Iompair Eireann

*Captain R. A. H. Lord*

Appointed District Marine Manager &
Harbourmaster, Holyhead, L.M. Region

Mr. L. Collins, B.E. (Mechanical & Electrical), B.Sc. M.I.E.E., A.M.I.Mech.E., M.I.Loco.E., who, as recorded in our February 28 issue, has been appointed Deputy Chief Engineer (Mechanical), Coras Iompair Eireann, was Student Apprentice with the British Thomson Houston Co. Ltd. at Rugby from 1938 to 1941. He became a junior mechanical engineer with Turf Development Board Limited, Dublin, in 1942, and Assistant Chief Mechanical Engineer of that company in 1944. In 1946 he became Chief Mechanical Engineer, Bord na Mona, Dublin. In 1954 he was appointed Assistant Chief Mechanical Engineer, Coras Iompair Eireann, becoming Deputy Chief Mechanical Engineer of that undertaking in 1956.

Mr. A. K. McAuley, B.Sc., M.I.C.E.I., who, as recorded in our February 28

issue, has been appointed Deputy Chief Engineer (Road Rolling Stock), Coras Iompair Eireann, was born in County Antrim in 1912. He was educated at St. Malachy's College, Belfast, and Queen's University, Belfast, where he obtained his degree in engineering. He later became a Graduate Apprentice with the English Electric Co. Ltd. at Rugby. He was appointed rolling Stock Engineer to the Dublin United Transport Co. Ltd. in 1941, and on the amalgamation of that company with Great Southern Railways in 1945 became Rolling Stock Engineer of the newly-formed C.I.E.

Mr. P. T. Somerville-Large, B.A., B.A.I., M.I.C.E.I., who, as recorded in our February 28 issue, has been appointed Chief Engineer Coras Iompair Eireann, responsible for all the Board's engineering activities, was educated at Fermoy, and at

Haileybury College. He took his arts and engineering degrees at Trinity College, Dublin. In 1922 he joined the Great Southern & Western Railway as a pupil engineer, and in 1925, after the general amalgamation of the railways became Assistant District Engineer in Dublin. In 1930, when the six former railway engineering districts were reduced to four, he became District Engineer, Dublin, and held this position until July, 1948, when he became Acting Chief Engineer. He was appointed Deputy Chief Engineer in 1951. He has been Vice-Chairman of the Irish Section of the Permanent Way Institution. In 1934, together with a number of other railwaymen, Mr. Somerville-Large founded the Mount Street Club, a unique self-subsistence scheme for unemployed men.

Captain R. A. H. Lord, Master of m.v. Cambria, of the London Midland Region

*Mr. J. C. H. Brash*

Appointed District Operating Superintendent,
Glasgow (North), Scottish Region

*Mr. W. F. Bolton*

Appointed Service Manager of
B.U.T. Limited

*Mr. H. Leach*

Assistant (Passenger Services)
L.M. Region, 1955-58

of British Railways, who, as recorded in our March 21 issue, has been appointed District Marine Manager & Harbourmaster, Holyhead, served during the war with the Royal Navy. Since 1946 he has served on every ship on the Holyhead Irish cross-channel services. He was first promoted to command cargo vessels in 1950 and to command in the mail service in 1954. He became Master of m.v. *Cambria* in 1956. Captain Lord was educated at Newton College, Newton Abbot, Devon, and at Colstons School, Bristol. He began his career with the British India Steam Navigation Company in 1924 and served as a cadet in the training ship *Wodarra*. After service with the B.I.S.N. Company and the Cunard Line he joined the L.M.S.R. at Holyhead in 1937. Detached for war service in October, 1939, Captain Lord served as Gunnery Officer in H.M.S. *Hector*, Commanding Officer of H.M.S. *Carina* and on the Staff at Royal Naval Headquarters, Bombay.

Mr. J. C. H. Brash, who, as recorded in our March 14 issue, has been appointed District Operating Superintendent, Glasgow (North), Scottish Region, British Railways, was educated at King's School, Warwick, and the University of Edinburgh, where in 1935 he graduated B.Sc. (Engineering). In 1936 he joined the service of the former London Midland & Scottish Railway at Dalmuir as a traffic apprentice and received training in Scotland and in England. He enlisted in the Royal Engineers (Transportation) in 1940, and served with 153 Railway Operating Company in Persia and Italy. Later he became D.A.D.Tn. Villach, was mentioned in despatches and made an M.B.E. (Military) for services in Italy. He was demobilised in 1946 with the rank of Major. After the war he was a member of H.Q. 18 Railway Group, in Supplementary Reserve, R.E. On demobilisation Mr. Brash was appointed to the department of the Operating Manager, Glasgow, and later served the offices of the District Goods & Passenger Manager, Perth, and District Traffic Superintendent, Perth. He was appointed Assistant to the District Operating Superintendent, Edinburgh, in 1949, and, in 1952, Assistant District Operating Superintendent, Edinburgh. In 1956 he was appointed Electrification Assistant to the Chief Operating Superintendent, Glasgow, the appointment he now relinquishes.

Mr. W. F. Bolton, A.M.I.Loco.E., M.S.A.E., who, as recorded in our March 7 issue, has been appointed Service Manager of British United Traction Limited, joined the A.E.C. organisation in 1935 entering the chassis inspection department. The following year he transferred to the railcar shops and, after experience at Southall and Birmingham running sheds of the G.W.R. with the operation and experience of A.E.C. railcars, his association with A.E.C. was severed by the outbreak of war. As a member of the Reserve of Engineer Officers he was absent from Southall between 1939 and 1946, during which period he saw service in Home, Arctic, Atlantic, Indian Ocean, and Pacific waters and attained the rank of Engineer Lieut.-Commander. After his return to A.E.C. and following a brief period in the engine test department, he was appointed Engineer Transport Officer to the then Gold Coast Government, a position he retained until in 1952 he transferred to the Sudan Civil Service in the Ministry of Mechanical Transport. With the advent of Sudanisation in 1955 Mr. Bolton re-

turned to England and joined B.U.T. Limited as a technical assistant at the London headquarters. He remained in this position until the following year when he was appointed Joint Railcar Service Superintendent, Southall, the position he has now relinquished on being promoted to Service Manager. Mr. Bolton has taken a keen interest in the training of railway staff in diesel matters and articles from his pen on this subject first appeared in *Diesel Railway Traction* in 1942. He is the author of a textbook for footplate staff entitled "Railwaymen's Diesel Manual," this was first published in 1956 and is now in its third impression. As recorded in our February 21 issue, Mr. Bolton recently has been in India where he set up a diesel railcar school for Indian Railways at Madras.

Mr. H. Leach, Assistant (Passenger Services) to the Commercial Officer, Euston, London Midland Region, who as recently recorded, is retiring after 47 years of service, began his railway career on the former L.N.W.R. in 1911 in the Chester & Holyhead District. After military service during the 1914-18 war, he occupied positions at Derby, Crewe, and Chester. During the last war he was Divisional Head Office Inspector at Crewe and, in 1944, became District Traffic Agent at Whitehaven. Mr. Leach has been at Euston Commercial Headquarters since 1946; he was appointed Assistant (Passenger Services) in 1955.

Mr. W. McAuley Gracie, M.B.E., Assistant Goods Manager, Southern Area, L.N.E.R., from 1927 to 1947, whose death was recorded in our April 18 issue, joined the Great Central Railway in 1902. After serving at several stations he went in 1905 to the office of the District Superintendent, Doncaster. In 1911 he was attached to the General Manager's Office in connection with new works and special matters. In the next year he became Personal Clerk to the Chief Goods Manager, and in 1915 was appointed Chief Clerk to that officer. In 1923 he became Assistant to the Goods Manager, Southern Area, in charge of Works, Traffic, Wagons & Parliamentary Matters; and he was appointed Assistant Goods Manager, Southern Area, in 1927; from 1941 he was seconded to the Ministry of Food. Mr. Gracie was at one time a member of the company's side of the Great Central conciliation board for goods workers, and during the 1914-18 war he was appointed by the Railway Executive Committee as Secretary to the Joint Negotiating Committee of Goods Managers and the N.U.R. Executive in respect of the conditions of service of those grades. He was for two years in 1939-40, Master of the Worshipful Company of Carmen, and in 1940-41 was President of the City Livery Club of London. As Director of Infestation Control, Ministry of Food, Mr. Gracie was responsible for organising and maintaining the control of food infestation in this country. He undertook missions to various countries to advise on control of infestation. Responsibility for the control of infestation in food and agriculture in England and Wales was subsequently placed on the Minister of Agriculture & Fisheries, and Mr. Gracie took charge of the combined work under that Ministry, retaining the title of Director of Infestation Control. He was a Fellow of the Royal Entomological Society, and a Foundation Member of the Institute of Transport. He was also a member of the Athenaeum. Mr. Gracie retired from railway service in 1947, and from the

Ministry of Agriculture & Fisheries in 1952, while remaining a consultant on pest control until his death.

AN APPRECIATION

The death of F. McA. Gracie creates yet another gap in the ranks of the able railwaymen of an earlier generation. W. M. G. came to the L.N.E.R. as the first Assistant Goods Manager of its Southern Area, from the former Great Central Company, which he had served as its Assistant Goods Manager. He brought with him an unequalled knowledge of his former company's equipment, resources and business and, with it, a remarkable flair for the commercial side of railway freight business. He always showed unbounded energy and resource, together with an infectious enthusiasm for railways. He was also a "character" and the impress of his personality was unmistakable. The railways lost a capable administrator when W. M. G. was drawn away to develop what had long been a side interest into full-time activity for the Government, during the war and afterwards, which perhaps no one else was so well equipped to undertake.

A.A.H.

Mr. K. W. C. Grand, General Manager, Western Region, British Railways, has been promoted in the Order of St. John of Jerusalem to the Grade of Commander (Brother).

We regret to record the death of Mr. W. A. C. Thorpe, former Deputy Chief Mechanical Engineer, North Western Railway.

We regret to record the death on March 20, in his 83rd year, of Mr. S. A. Reitsma, Editor of our Netherlands contemporary *Spoor- en Tramwegen* from its first issue in July, 1928, to his retirement at the end of 1949. Mr. Reitsma began his career as an army officer, later entering the service of the State Railways in the then Dutch East Indies. Among other works on railway subjects, he prepared a book commemorating the jubilee of the lines in those territories. On returning to the Netherlands he was invited to edit *Spoor- en Tramwegen*, then a new journal.

Mr. E. R. Arlow, Assistant Shipping Traffic Superintendent, Belfast, London Midland Region, British Railways, has been appointed Shipping Traffic Superintendent at that port.

London Midland Region, British Railways, announces the following appointments:

Mr. S. A. Gilbert as Recruiting Officer, London, for the London Midland, Eastern, Southern and Western Regions.

Mr. A. R. Smith as Assistant District Operating Superintendent, Nottingham.

Mr. C. G. Whittaker as Assistant (Passenger Rolling Stock), Operating Officer's Office, Euston.

Mr. A. S. Turner as Assistant (Modernisation) to Operating Officer, Euston (located Crewe).

Mr. R. Cumming as Assistant Electric Traction Engineer, Stonebridge Park.

Mr. L. Billingham as Goods Agent, Carlisle.

Mr. Ewen MacDonald, Assistant to the European Colonisation Manager, Canadian Pacific Railway in London, has been appointed European Colonisation Manager in succession to Mr. G. A. Glennie, who has been transferred to Montreal.

NEW EQUIPMENT AND PROCESSES



Rolling Stock Underframe Sprayer

THE Wakefield model 3493V underframe sprayer has been specially designed for use in the Western Region of British Railways to clean the underframes of rolling stock. It is basically a 9-gal. pressure vessel equipped with facilities for spraying detergent mixture.

The mixture is dispensed under high pressure through 40-ft. of hose terminating in a special spraying nozzle. A 40-ft. length of 1-in. hose is also provided, to connect the unit to the air supply.

The pressure vessel is built to Board of Trade specifications and a pressure gauge is provided, as well as a valve for isolating the hose when necessary. When not in use, both hoses can be coiled on saddles as shown in the illustration. The whole unit is mounted on two wheels.

The price is £67 10s. The Wakefield underframe detergent sprayer is marketed in the United Kingdom by Wakefield-Dick Industrial Oils Limited, 67, Grosvenor Street, London, W.1, from which company further details may be obtained.

Machining Time Calculator

A DEVICE, of the circular slide-rule type for calculating machining times is applicable in workshops of railways or railway engineering contractors.

The calculator quickly and accurately determines machining times for turned components of all kinds, produced on centre-lathes, turret and capstan lathes and boring mills. Actual times required (including all normal allowances), are read off directly after the simple setting of a few scales.

Cutting time is read off on one side of the calculator, shown in the accompanying illustration, after setting the dials to the appropriate information, such as material, type of tool, diameter of work, length of cuts, number of cuts.

Other dials and scales on the reverse side of the calculator give the time increments for loading, manipulation, gauging and so on, taking into account the necessary allowances according to the type of work being undertaken. Setting up times are also provided in a separate section.

The instrument is suitable for any turned component between $\frac{1}{2}$ in. dia. and 80 in. dia. and lengths between $\frac{1}{2}$ in. and 200 in. It is manufactured from transparent and white perspex, with four colour engraved scales and supplied complete in a cloth covered case. The main disc is $7\frac{1}{2}$ in. dia.; it is robustly constructed to withstand constant daily use.

It is intended as the first of a range of similar instruments for use by ratefixing and estimating departments when calculating times for all kinds of machining operations. The price of the calculator, including cloth-covered case, is 58s. 6d.

The calculator is manufactured by Fearn, Mear & Company, 43, St. Helens Road, Almondbury, Huddersfield.



Flexible Hose Connections

TWIN-SADDLE renewable hose-ends, recently introduced, have been developed to provide a simple means of coupling high-pressure industrial hose. No special equipment of any kind is required and the outer cover is not stripped off the hose-end.

Applications include hydraulic coupling lines, and high pressure steam holding lines in any position where vibration makes the use of metal piping rather doubtful for flexible hydraulic services in maintenance yards.

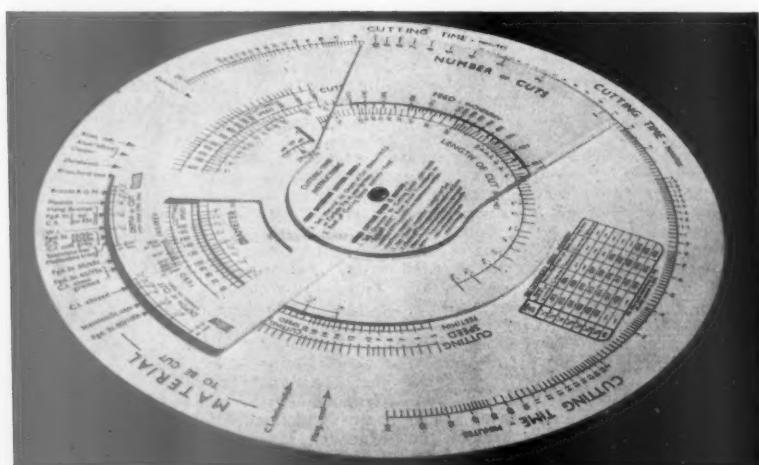
Essentially the end fitting consists of a steel insert and two forged steel saddles which interlock with it. The twin saddles are drawn tightly together by means of two or more high-tensile steel bolts. The inner surfaces of the saddles are forged into a series of ridges. The insert is also provided with a similar series of ridges, accurately positioned in relation to the ridges in the saddles.

When the latter are clamped together by means of the bolts these inner and outer ridges grip the walls of the hose and its internal wire braiding between them. At the same time annular grooves in the saddles interlock with a raised collar on the insert. In this manner the hose end, the twin-saddles, and the insert are all secured together firmly so that it is impossible for the hose to be withdrawn from the coupling.

No skill is required to make a pressure tight hose connection with these hose ends. The only tools required are two standard spanners. Twin-saddle ends are also heavier and far more robust than the usual hose connections.

The hose units are normally supplied with straight standpipe ends, making it possible for them to be used in conjunction with every kind of the manufacturer's range of pipe fittings. A number of combinations of end fittings can also be supplied.

The manufacturer is the British Ermeto Corporation Limited, Beacon Works, Hargrave Road, Maidenhead, Berks.



Demonstration Run of First Eastern Region Type "4" Diesel

English Electric-Vulcan 2,000-h.p. diesel-electric locomotive on return trip to Norwich

The first Type "4" 2,000-h.p. English Electric-Vulcan-built diesel-electric locomotive for British Railways hauled a nine-coach train on a demonstration run last Friday. The train ran from Liverpool Street via Colchester to Norwich and back. The locomotive, numbered D200, is described on page 481 of this issue.

The 10 locomotives, ordered, are to be delivered at the rate of one every two weeks; by the autumn there will be enough to enable all the principal expresses between London and Norwich to be diesel-hauled in a journey time of 2 hr. or less for the 115-mile journey.

The train of some 324 tons included five of the prototype passenger coaches, first seen at the British Railways Modern Travel Exhibition last June. It covered the outward journey of 115 miles in 118 min., with one stop at Ipswich. The return journey was completed in 128 min., with stops at Ipswich, Colchester, and Chelmsford.

The introduction of diesel power to Norwich will free class "7" "Britannia" 4-6-2 steam locomotives and they will be used to improve services to Clacton.

By 1961, Stratford Motive Power Depot, formerly the biggest steam depot in the country, will be completely changed over to diesel working. Workings into and out of Liverpool Street Station will eventually be almost entirely by electric or diesel.

Areas which will be affected by main-line diesel-hauled services, which the new locomotives will make possible, were represented by the Lord Mayor of Norwich, and the Mayors of Ipswich and Chelmsford.

At luncheon, at Norwich, speeches were made by Sir Edmund Bacon, Eastern Area Board (on behalf of Sir Reginald Wilson, Chairman of the Board, who was away in South Africa), who welcomed the guests; replies were made by the Lord Mayor of Norwich, Councillor T. C. Eaton, and

Viscount Bridgeman, Director of the Vulcan Foundry Limited.

Those who travelled on the train included:

Eastern Area Board: Sir Edmund Bacon, Messrs. A. F. Pegler, J. B. Peile, G. A. V. Hayes, Members;

British Transport Commission: Messrs. R. C. Bond, Chief Mechanical Engineer; J. A. Broughall, Electrical Engineer (Development); E. S. Cox, Mechanical Engineer (Development); T. H. Hollingsworth, Traffic Adviser; L. James, Chief of Police, Eastern Area; R. Thompson, Motive Power Officer; E. J. Vipond, Operating Officer; S. B. Warder, Chief Electrical Engineer; J. W. Watkins, Member;

Eastern Region: Messrs. H. C. Johnson, General Manager; D. Beattie, District Commercial Officer, Norwich; M. R. Bonavia, Principal Officer (Modernisation); G. W. Brimyard, Public Relations Officer, Line Traffic Manager (Great Eastern); G. Coaker, Commercial Superintendent (Great Eastern); K. J. Cook, Chief Mechanical & Electrical Engineer; F. G. Crabb, Commercial Officer; A. R. Ewer, District Motive Power Officer, Liverpool Street; D. Fenton, Movement Superintendent (Great Eastern); H. W. Few, Traffic Manager, Liverpool Street; G. F. Fiennes, Line Traffic Manager (Great Northern); T. A. Germaine, Public Relations Assistant; G. G. Goodings, Traffic Manager, Norwich; N. Hamilton, Public Relations Adviser; S. G. Hearn, Assistant General Manager; H. Hoyle, Movement Officer; R. E. Lawler, District Commercial Officer, Ipswich; T. C. B. Miller, Motive Power Officer (Great Eastern); C. G. Palmer, Motive Power Officer (Great Northern); A. Punter, Senior Instructor, Ilford Diesel School; B. Spencer, Chief Technical Assistant; W. A. G. Sudaby, Traffic Manager, Cambridge; A. W. Tait, Assistant General Manager; E. D. Trask, Headquarters; M. B. Thomas, Public Relations & Publicity Officer; W. G. Thorpe, Line Traffic Manager (Great Eastern); *Southern Region:* Messrs. C. P. Hopkins, General Manager; W. J. A. Sykes, Chief Mechanical & Electrical Engineer;

English Electric Co. Ltd.: Viscount Bridgeman, Director, Vulcan Foundry Limited; Messrs. K. Beaglehole, Deputy Manager, Traction Department, Bradford; J. Driscoll, Sales Manager, Diesel Engine Division; B. H. Harrison, Traction Department, London; W. G. Jewett, Chief Engineer, Traction Department, Bradford; C. R. Parker, Manager, Traction Department, Bradford; J. H. A. Sharpley, Assistant Manager (Traction), Preston; A. V. Stewart, Traction Department, London; W. L. Topham, London Manager and Overseas Representative; C. C. H. Wade, Manager, Traction Sales & Contracts;

Messrs. W. J. Evans, Assistant General Secretary, A.S.L.E.F.; J. E. Ridsdale, M.P. for Harwich; and G. Rippon, M.P. for Norwich South.

Motive Power Policy for Rhodesia

In connection with the report by Messrs. Freeman, Fox & Partners and Messrs. Merz & McLellan on motive power for the Rhodesia Railways, the subject of an editorial article in our March 28 issue, the (Rhodesia & Nyasaland) Federal Minister of Transport & Works, Mr. W. H. Eastwood issued the statement reproduced below.

"Since receiving the report of the engineering consultants engaged to examine traction policy, the Rhodesia Railways and the Ministry of Transport have been studying the calculations and recommendations to determine the manner and extent to which development work at present in progress or shortly to be commenced should be adapted to suit whatever policy is followed in the future.

"The Rhodesia Railways recently took delivery of 46 "20th" class Garratt locomotives and they are about to receive 12 new English Electric diesel-electric locomotives. With these additions to the existing locomotive fleet it is calculated that the tractive effort available will be adequate to enable demands to be met for some years to come, although, in the course of the continuous revision to which Rhodesia Railways development plans are subjected, it may later be found necessary to make small additions to the fleet. In short, the increments of power likely to be needed during the next few years are not expected to be of such a size as to enable the present fleet of steam and diesel locomotives to be worked to capacity if any significant portion of the Rhodesia Railways route were to be converted to electrical traction.

"Whilst it is true that the report of the engineering consultants showed that substantial economies could be achieved in running costs by converting selected sections from steam to other types of traction, there are two points upon which the Rhodesia Railways and the Government would require to be satisfied before embarking on an electrification programme. The first point concerns the employment of displaced locomotives, which has already been mentioned. The second point arises out of the change in circumstances compared with the position prevailing at the time that the consultants were briefed for this enquiry, which imposes on the railways the need to minimise capital outlay due to shortage of loan capital; this means that changes in motive power requiring heavy capital outlay are unlikely to find favour under present conditions despite long-term advantages, so long as alternatives are available for adoption requiring much smaller capital."



Special train hauled by Type "4" English Electric diesel near Colchester

Civil Engineering Work in Eastern Region

Bridge reconstruction and other work preparatory to 50-cycle electrification of Enfield Town and Chingford lines

In connection with the electrification at 50 cycles of the Liverpool Street to Enfield Town and Chingford sections of the Great Eastern Line of British Railways, Eastern Region, a great deal of civil engineering work has been and is being carried out. Besides making provision for erection in due course of overhead electric equipment, bridges have had to be rebuilt, or in some cases, the track beneath bridges and several tunnels lowered, so as to afford clearances.

Certain work is being carried out so as to minimise interference with the intensive passenger services introduced on electrification.

The following works in progress, or recently completed, were inspected on April 20 as being representative of work being carried out under the supervision of the District Engineer, Stratford, in the area of the Traffic Manager, Liverpool Street.

Cambridge Main Line to Angel Road

Bishopsgate Tunnel: reconstruction of overbridge (Brick Lane) to provide additional headroom.

Between Bethnal Green and Hackney Downs: extensive repairs to steelwork of underbridges.

Hackney Downs: steelwork being repaired on two underbridges.

Between Hackney Downs and Clapton: three underbridges in 5 CH. distance were recently constructed to provide clearance.

Between Clapton and Copper Mill: two overbridges have been similarly reconstructed.

Tottenham Station: the platforms have been raised.

Between Tottenham and Angel Road: re-laying of up main line in progress; 40 60-ft. lengths of rail were laid last weekend and 44 lengths will be laid during the coming weekend, using tracklaying machine and scarifier. The new track consists of jarrah sleepers with "C" type Mills rail clips. Once the track has been bedded down and the temperature is suit-

able, long-welded rails will replace the 60-ft. lengths.

Hackney Downs to Enfield Town

Rectory Road: two underbridges are being completely reconstructed, the new bridges being built alongside the existing bridges on trestles spanning the public roadways, and due to be rolled in shortly.

Stoke Newington Tunnel: lowering of the up line is in progress to provide clearance; the down line was lowered in February. The track is to be taken up in 60-ft. lengths and stacked clear of the site by a mechanical tracklayer and then re-laid in similar fashion at the end of the work. Blanketing also is being carried out.

Between Stoke Newington and Stamford Hill: complete reconstruction of overbridge to give clearance.

Between Stamford Hill and Seven Sisters: track is on waybeams as underbridge is in course of reconstruction.

Between Seven Sisters and Bruce Grove: one overbridge has been reconstructed; another is being reconstructed for overhead clearance; and widening is also being carried out for the local authority. On the same section two underbridges have been rolled in and are being finished off. Another is being prepared for rolling in early next month. A fourth is being prepared for reconstruction to be completed in the autumn; this job also involves road widening on behalf of the local authority. A fifth underbridge is undergoing repair. All these operations are going on within a distance of half-a-mile.

White Hart Line Station: platforms and tracks have been raised because adjoining underbridge has been reconstructed and raised in the process by 2 ft. 9 in. to give increased headroom for double-deck buses in White Hart Lane.

Between White Hart Lane and Silver Street: overbridge, originally a road bridge, has been reconstructed as a footbridge.



Lowering the track at Stoke Newington: rolls of roofing felt being placed in position over first layer of sand

Between Silver Street and Lower Edmonton: underbridge undergoing repair.

Between Lower Edmonton and Bush Hill Park: footbridge raised 3 ft. to give headroom; reconstruction of overbridge completed to give headroom, and widening for local authority; Cambridge arterial road overbridge being widened for Ministry of Transport.

Bush Hill Park: reconstruction of overbridge to give overhead clearance and widening for local authority; footbridge raised by 2 ft.

Enfield Town Station: Station frontage entirely rebuilt with extensive alterations to the rear of the buildings. Alterations to rail layout include broadening of one platform.

Other Work in Progress

Besides those referred to above, the following works were in progress on April 20, which shows the magnitude of the commitments in the London suburban area of the Great Eastern Line, apart from work on the Tilbury Line:

(1) Painting girders in Bishopsgate Tunnel (up and down Suburban Lines blocked 3.35 p.m. Saturday to 5 a.m. Monday; platforms 1, 2, and 3 at Liverpool Street out of use); (2) adjusting rails between Forest Gate and Manor Park; (3) demolishing skew span on Cranbrook Road Bridge at Ilford and adjusting overhead wiring; (4) Ilford car sheds remodeling; (5) work on overhead structures between Shenfield and Southend; (6) re-laying down line between Billericay and Wickford; (7) re-laying up line between Rochford and Hockley; (8) permanent way alterations, drainage and demolition of bridge 1319 between Lea Bridge and Copper Mill Junction; (9) drainage and building new retaining wall between Hoe Street and Wood Street; (10) reconstruction of bridges between Hoe Street and Highams Park; (11) extension of platform at Wood Street; (12) repairs to bridge between Wood Street and Highams Park; (13) excavation work for new carriage sidings between Highams Park and Chingford; (14) bringing into use new signalling at Copper Mill Junction; (15) re-laying at Broxbourne Junction; (16) extension of platforms at Roydon, Sawbridgeworth, and Bishops Stortford; (17) repairs to bridge between Hadham and Standon; and (18) re-laying at Hertford East.

K. & L. STEEL CASTINGS DRESSING SHOP AT HALSTEAD.—An appeal for industrial development in north-west Essex has coincided with the need for extended facilities required by K. & L. Steelfounders and Engineers Limited of Letchworth. Because of needed increased capacity of the steel castings dressing shops, it was decided to plan an extension at Halstead, Essex. Ground works for the building were started last November, and all roads, drainage, foundations, site levelling and mains services are now complete. The building will be completed by July. Mr. R. A. Butler, Lord Privy Seal and Member of Parliament for this area, will open the building on July 19. The total working area will be about 25,000 sq. ft. and auxiliary buildings will include an office block and a service and maintenance section. Provision is being made for the welfare of the workpeople, including shower facilities, changing rooms and canteen arrangements. The total cost of the project is estimated to be around £90,000.

Permanent Way Work at Barking, Eastern Region

The principal structures involved in the Barking flyover and station reconstruction scheme, described in our issue of March 21, are mainly situated on and around existing tracks on which train services must be maintained throughout the duration of the work.

The whole construction work is, therefore, being carried out in carefully designed stages each of which involves the prior displacement of one or more tracks. The tracks are usually re-laid clear of the required working area and coupled in to the existing alignment at night, or on a Sunday, under possession of the line.

On April 12 and 13, extensive permanent way and signalling alterations were carried out east and west of Barking Station to temporarily divert the main Fenchurch Street-Southend lines, to allow construction to proceed on the western end of the diversion at Barking East and to clear a further working area for parts of both flyovers, west of the station.

Permanent Way Work

The St. Pancras-Tilbury lines cross the main lines east of Barking Station and the diversion of the latter involved replacement of the diamond crossings, with the junctions forming the connections between the two pairs of lines. As much of the work as possible was carried out beforehand, clear of the running lines, but in the course of the week-end possession, most of the lines on the south side, east of the station, were taken up and re-laid on a new alignment and altogether five sets of points and six diamond crossings were laid in during the week-end operation. West of the station, the main lines now run on tracks which previously existed but which served a different function. Some alterations to the layout were necessary and some earthworks were involved in the adjustment of level differences. Work commenced at 2.30 p.m. on Saturday and continued without break until 4 a.m. on Monday morning, in the course of which three shifts of some 90 men each and three steam cranes were employed.

Signalling Work

The whole of the signalling work in connection with this changeover was planned and executed in four months. It involved 21 new track circuits, eight new mechanical signals, 120 additional relays, and 32 additional electric lever locks.

A new cable route was provided for a distance of 500 yd. and some five miles of multicore cable of various sizes was installed. A total of 2,000 yd. of point rodding and some three miles of mechanical signal wire was installed in connection with the work. The signalling work is entirely of a temporary nature and contributes nothing to the final signalling scheme.

Train Alterations

During the whole period of the work, all steam trains on the Fenchurch Street-Southend line were diverted over the electric lines between East Ham and Dagenham East. On the Saturday, this involved a reduction in frequency of District Line trains and the cancellation of some steam services. On the Sunday, a revised steam timetable on the Fenchurch Street-Southend line was introduced, and the Tilbury line was closed between Barking and Dagenham Dock with a special bus service provided between these points.



Work in progress at Barking East, showing severed up and down Fenchurch Street-Southend lines behind jib of crane : new alignment is behind the signalbox

Trial of Engine Driver for Manslaughter

Driver of steam train involved in St. John's accident on December 4, 1957, tried at Old Bailey

The trial began on April 21 at the Central Criminal Court (Old Bailey), London, of Driver W. J. Trew, of Ramsgate, who drove the London to Ramsgate steam train which ran into the back of a stationary electric train at St. John's, Southern Region, on December 4, 1957. He pleaded not guilty to a charge of unlawfully killing Guard W. R. Reynolds, the guard of the electric train.

Mr. Christmas Humphreys, opening the case for the Crown, stated that in thick fog, the defendant, with a long and heavy train behind him, passed a signal which was at red after two warnings about a quarter-of-a-mile apart from a double yellow and a single yellow signal. He was travelling at a speed of 30-40 m.p.h. Then, within 138 yd. of passing the red signal, he ran into the electric train.

Inquiries made immediately after the collision had established that the signalling system was working perfectly and the brakes of the steam train were in good order. The collision could therefore "be due to what one might call a human error on the part of the driver."

Mr. Humphreys added that it would be ideal if all signals were on the left-hand side of the track, because a driver normally stood on the left side of his cab, but that was not possible for practical reasons. On the stretch of track with which the jury were concerned the signals were on the right. Each driver had a fireman with him who helped in spotting signals, but his main job was to tend the fire.

According to expert opinion, he continued, Trew should have reduced his speed to 15 m.p.h. on seeing the double-yellow, and then to 5 m.p.h. at the single yellow. The drivers of the two preceding trains on the line had done exactly that.

It was not until December 19 that the defendant was able to make a statement. He then said, Mr. Humphreys alleged: "We were delayed because of fog. I have had experience over this particular run for 15 or 20 years. We had a straight run through from London Bridge to New Cross. After leaving New Cross the signals changed to red on the fireman's side. I had just managed to see the green light at New Cross and carried on. I saw a white one just before I got to St. John's. Before I saw the single white light I saw a glimmer of two white lights. I call them white, but they are supposed to be yellow. The fog was so thick I could only see the signals when I was on top of them. That is the reason I was not travelling fast. I could only just see the signals from my side by looking through the cab window in front. My side is the left side. I just dropped my handle to reduce speed."

"Brakes Hard On"

"I cannot estimate the speed, but it wasn't very fast, and I said to my mate, 'What have we got?' and he said, 'A red one.' The brakes were then hard on. I could not give her any more. I then heard a bang and the engine came to a violent stop. Someone helped me from the engine and I was taken to hospital."

Fireman C. D. Hoare, the fireman of the engine involved, cross-examined by Mr. F. H. Lawton, Q.C., for the defence, agreed that during firing, the flood of light from the fire door made it even harder for the driver to see signals ahead. There had also been complaints about smoke hanging around the particular type of engine that was being used. This also added to the difficulty of spotting signals.

At the resumed hearing on April 22, Driver J. B. Skilton, who had driven the

electric train, said that from New Cross onwards the fog was dense. On leaving New Cross he got a one yellow signal at L.16 and reduced speed. He then came to L.17, which was one yellow, and proceeded with caution. The fog was thicker at St. John's station and he passed through at a walking pace. He saw signal L.18 when he was "nearly on top of it"; it was one yellow and he proceeded with caution to the next signals, M.5 and M.8, which were both at red.

He left the cab and spoke by telephone to the signaller at Parks Bridge signal-box. He then returned to his cab and 4 min. later felt a jolt from behind.

Answering questions, he agreed that it was much easier to see a signal from an electric train than from a "Battle of Britain" locomotive with its 30-36 ft. long boiler.

Reducing Speed

Mr. G. A. Weeden, Assistant Motive Power Superintendent, Southern Region, answering Mr. Humphreys, said when a driver had a double yellow signal he should reduce speed to 15 m.p.h. and on encountering a single yellow he should reduce still further to 5 m.p.h. or a walking pace so that he could stop at a red signal. If the brakes were applied suddenly and fully that was likely to be noticed by the passengers, who would be thrown forward in their seats.

Driver Trew stated in evidence that on December 4, 1957, he left Cannon Street for Ramsgate at 6.8 p.m. As far as New Cross the fog was patchy but it was possible to see the signals. All he remembered was leaving New Cross in a thick fog and when he got to some lights—the lights on the platform at St. John's station—he asked the fireman "What have we got?" and he said: "A red." He applied the brake hard on. The next thing was he was into the back of an electric train. He did not see any lights until St. John's. It was too thick to see. Between New Cross and St. John's he was looking for the signals with his hand on the brake.

What sort of speed were you travelling?—I should say 20-25 m.p.h.

When you did apply the brakes, what seemed to happen?—There was a bump. When I applied the brakes the weight of the train seemed to push me forward.

Worsening Conditions

In reply to Mr. Humphreys, cross-examining, Driver Trew said that at New Cross the conditions got worse. He knew he had three signals in the next half-mile. He did not see the double yellow as a glimmer in the fog. He did not know he had passed the point where the light would be, but he knew where he was when he saw the lights of St. John's station. The first he knew that he had passed signals L.16 and L.17 was when he got to St. John's.

Asked whether he slowed down to 5 m.p.h., as a careful driver, he replied that he knew he was all right to St. John's.

You knew there was a possibility that the signal at St. John's would be at red?—Yes.

What right had you to approach it at 20-25 m.p.h.? I had no right at all.

Why did you approach St. John's at 20-25 m.p.h.? I was expecting a green. I had never stopped at St. John's all the time I had been driving.

Were you driving in such a way that you assumed that every light would be green in your favour?—No.

He agreed that he had no right to assume that the signal would be green,

and that he never braked before he saw the signal at danger.

I must suggest that you passed that red light at more like 30-40 m.p.h. than 20-25. Do you still say it was 20-25?—I think so.

Mr. Humphreys, in his final speech for the Crown, said it could not be suggested by the defence that there was no negligence. The facts spoke for themselves.

In his statement Driver Trew had said that he passed a double yellow and a single yellow signal. Now in the witness box he had said he did not see either

signal. That was something which was infinitely worse.

Mr. Lawton, in his final speech for the defence, said that Trew's case was that he got into a cutting of blackness and darkness and did not know where he was. The first lights he saw were those at St. John's station and then it was too late.

On April 23, Mr. Justice Jones summed up. After an absence of some 4 hr., the jury declared itself unable to agree. It was discharged, and the Judge ordered a new trial for the next session.

Staff and Labour Matters

Railway Wages Dispute

Discussions between the Government, the B.T.C., and the unions

After the meeting on April 17 between a sub-committee of the three railway trade unions (the President and General Secretary of each Union) and the Chairman and other representatives of the B.T.C., it was decided to suggest that the Government should see the parties before they resumed their discussions.

The Prime Minister, the Chancellor of the Exchequer, Mr. D. Heathcoat Amory, and the Minister of Transport met representatives of the Commission and of the three railway Unions on the afternoon of April 22, after which the following statement was issued:

"There was a full and frank exchange of views on the situation in regard to the railway pay claim in the light of the findings of the Railway Arbitration Tribunal and of subsequent discussions between the commission and the unions.

"The representatives of the trade unions urged that the Government should provide additional financial facilities to the Commission in order to make possible an immediate increase in salaries and wages.

"The Chairman of the B.T.C. outlined the action already being taken by the Commission for effecting substantial improvements in the net revenue position and said that further steps of a similar nature were being investigated. These included closing down unremunerative services and a thorough survey of their services with a view to further action of this kind.

"The Chairman said that the co-operation of the unions would be sought in the measures proposed above. Even taking account of the above, the Commission's financial position would not justify at present an increase in railway wages and salaries. Nevertheless, the purpose of the Commission was to provide sufficient assurance of an improvement in the Commission's position, to enable it to agree with the unions on a date by which railway wages and salaries could be reviewed. With that end in view, he had prepared certain proposals in relation to the railway modernisation programme and other matters.

"The Prime Minister, in reply, said that the Government had held consistently to the view that arbitration awards should be accepted. In its report the tribunal had said that the evidence showed that the basic rates of staff covered by the present claims were low in comparison with those cited as applying in other nationalised industries, public services, and certain private undertakings. The way out of the difficulty was not by subsidy but by a

concerted effort to increase efficiency and productivity. The surest road to this was the great modernisation programme on which the commission had embarked and a more intense programme for pruning the railway services by reducing or cutting out uneconomic services.

Re-examining Modernisation Programme

"He therefore made the following proposal. Provided that the Commission, with the three railway unions, was prepared to effect the maximum economy in operation and to join in ensuring the most efficient use of manpower, the Government was prepared to re-examine at once the programme of modernisation and to give any necessary support to the reductions in uneconomic services as well as to consider other points put forward by the Chairman of the Commission. The benefits from this should accrue in steadily increased standards of living for all those who worked on the railways as well as in a better service generally to the public.

"The representatives of the B.T.C. and of the railway unions thanked the Prime Minister for his reply, which they would consider together at an early meeting."

A further meeting has been arranged between the B.T.C. and the unions to consider what course should be taken.

L.T.E. Railwaysmen's Claim

Claims for higher pay and shorter hours for London Transport Underground railway workers were rejected by the London Transport Executive Committee on April 22 in discussion with the three railway trade unions, which will now consider whether to refer the claims to the London Transport Wages Board for arbitration.

Strike Action Urged

Meantime some N.U.R. members have become restive. On April 20 Manchester railwaymen decided to call on the N.U.R. national executive to declare a national stoppage on May 4 if a favourable decision is not reached by then on their wage claim.

London Busmen's Decision on Overtime

A delegate conference of Central London busmen on April 17 decided not to ban overtime as a protest against the cuts in summer schedules which are due to start at the end of April. The conference resolved not to take this or any other action which would prejudice the strike on the wages issue which is due to begin on May 5.

Contracts and Tenders

Hunslet diesel-hydraulic locomotives for Madras Port Trust

Queensland Government Railways has placed an order with the Commonwealth Engineering (Queensland) Pty. Limited, for 300 40-ton bulk grain wagons at a cost of some £A1,000,000.

Tullock Limited, on New South Wales, has received an order from the Tasmanian Government Railways for two 350-b.h.p. diesel-hydraulic locomotives with Rolls Royce engines and Krupp-Lysholm hydraulic torque converters.

The Hunslet Engine Co. Ltd., has received an order for four 274-h.p. 0-6-0 type broad-gauge diesel-hydraulic locomotives for Madras Port Trust. They are required for haulage of goods wagons inside the Madras Port area, and will incorporate a Paxman 6RPH diesel engine developing 257 h.p. at 1,500 r.p.m. under site conditions. Weight in working order is 35 tons and maximum tractive effort with 3.3 to 1 adhesion is 23,800 lb.

Krauss-Maffei A.G. has received an order from the German Federal Railway for 30 Class V.200 diesel-hydraulic B-B type double engine 2,200 b.h.p. locomotives of about 78 to 80 tons weight. This will bring the total number of these locomotives on the German Federal Railway up to 85.

Maybach Motorenbau G.m.b.H. has received an order from the German Federal Railway for 58 diesel engines of type MD. 650, set to 1,100 b.h.p. each, to form the power units of 29 of the 30 Class V.200 locomotives ordered from Krauss-Maffei.

Arn. Jung Lokomotivfabrik has received an order from the German Federal Railway for 15 of the standard V.60-class three-axle diesel-hydraulic shunting locomotives with Maybach 650 b.h.p. engines and Voith transmissions.

British Railways, Eastern Region, have the following contracts:—

R. Ridd & Son (Contractors) Ltd., Hornchurch, Essex: cleaning and painting of roofs, arcades, mail bag depot, parcels acceptance office, offices, stairs, stores, corridors, lobbies, toilets at Cheyne Road and Wellers Court, Kings Cross

Dorman Long (Bridge & Engineering) Limited, Luton, Beds: reconstruction of portion of superstructure of underline bridge No. 1354 over Westgate Street, between Cambridge Heath and London Fields

R. F. Herron Limited, Ruislip, Middx: renewal of covering of roof over Fish Dock Road at Kings Cross Goods Depot

Sir William Arrol & Co. Ltd., Bridge-ton, Glasgow, S.E.: reconstruction of superstructure of underline bridge No. 1930 over Seven Sisters Road between Stamford Hill and Seven Sisters

Craven Brothers (Manchester) Limited, Reddish, Stockport: supply and delivery of one Craven electrically driven 5 ft. faceplates locomotive wheel lathe for Stratford Locomotive Works.

W. & C. French Limited, Buckhurst Hill, Essex: reconstruction of superstructures of overbridges Nos. 117 and 172 between Grays and Pitsea, and re-

construction of superstructures of overbridges Nos. 12, 26, and 28 between Upminster and Grays

May, Gurney & Co. Ltd., Trowse, Norwich: repairs to substructure of train ferry terminal bridge at Harwich

W. & C. French Limited, Buckhurst Hill, Essex: provision of certain earthworks, new carriage shed, drainage, water supplies, roads, paths, concrete water tower and amenity building at new Ilford Electric Train Depot extension.

British Railways, London Midland Region, have placed the following contracts:—

Leonard Fairclough Limited, Adlington, Lancs: reconstruction of bridge No. 22 and retaining wall at Slade Lane Junction, and alterations and extensions to platforms at Sandbach, Holmes Chapel, Goostrey and Chelford Stations

A. H. Anderson, London, S.W.1: accommodation for Tebay Branch of London Midland Region Staff Association

The Token Construction Co. Ltd., London, W.1: office accommodation for Divisional Traffic Manager, Nottingham

A. E. Knights, Chapel-en-le-Frith, Nr. Stockport, and the Eagle Construction Co. Ltd., Scunthorpe, Lincs: permanent way maintenance work

Trollope & Colls Limited, London, E.C.2: offices for Divisional Traffic Manager, Royal London House, Finsbury Square, London, E.C.2.

British Railways, North Eastern Region, have placed the following contracts:—

Drummond-Asquith (Sales) Limited, Birmingham: radial drilling machine, Darlington Locomotive Works

Westinghouse Brake & Signal Co. Ltd., Kings Cross, London: provision of colour light signalling, Pelaw Station

W. Richardson & Co. Ltd., Darlington: supply and erection of independent chimney, York Old Station Buildings

B.K.S. Air Survey Limited, Leatherhead: aerial surveys, Newport, York, and Selby

Turnerised Roofing Co. Ltd., London: Turnerising roof process, York goods warehouse roof.

British Railways, Western Region, have placed the following contracts:—

Staverton Builders Limited, Totnes, Devon: improvements to the down side booking and inquiry offices at Torquay Station

Abell & Smith's Electrical Co. Ltd., Worcester: supply, installation, testing, connecting, and setting to work of electric lighting facilities at Passenger Station and Yard, Worcester Shrub Hill and at Worcester Sheet Shops

North Acton Conveyor & Elevator Co. Ltd., Acton, W.3: supply and erection of one electrically driven slat conveyor at goods shed, Merthyr Plymouth Street

The Colston Electrical Co. Ltd., Exeter: supply, installation, testing, connecting, and setting to work of electric lighting facilities at Passenger Station, Exeter St. Davids

A. Cameron Limited, North Cheam, Sutton, Surrey: brush painting the Signal Engineer's Offices, workshops and

stores buildings at Reading Signal Works

Wakefield-Dick Industrial Oils, Limited, London, W.1: supply and installation of plant for the bulk storage and dispensing of lubricating oil and the storage and dispensing of anti-freeze mixture at diesel oil fuelling and dispensing depot, Tyseley

British Insulated Callender's Construction Co. Ltd., Leicester Square, W.C.2: installation of cable and the recovery of the existing overhead pole route between Chepstow and Caldicot Junction

A. & C. Buildings Limited, Thundersley, Essex: supply and erection of a platform canopy at goods depot, Merthyr Plymouth Street

Turriff Construction Corporation Limited, Warwick: completion of constructional works for new loops and junctions at Fenny Compton

Vic Hallam Limited, Nottingham: provision and erection of the superstructure of a new signalbox at Machynlleth

Charles Spreckley & Co. Ltd., London, W.C.1: alterations to the up side refreshment rooms, No. 6 platform, Slough Station

W. H. Streeter Limited, Hampton, Middx: reconstruction of the downside buildings at Kensington Olympia Station

British Insulated Callender's Construction Co. Ltd.: installation of cables between Slough and Reading.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follows:—

From Pakistan:

25 broad-gauge diesel-electric locomotives.

The issuing authority is the Ministry of Communications. The tender No. is PRS-58/LOCO/2/SHPT. Bids should be sent to the Director-General (Railways), Railway Division, Ministry of Communications, Government of Pakistan, Karachi. The closing date is May 6, 1958. The Board of Trade reference is ESB/9998/58.

71 broad-gauge passenger carriages complete with bogies

73 metre-gauge passenger carriages complete with bogies

Alternatively

71 broad-gauge passenger carriages complete but with bogies separate

73 metre-gauge passenger carriages complete but with bogies separate

62 broad-gauge passenger carriages in dismantled condition

30 metre-gauge passenger carriages in dismantled condition

The issuing authority is the Ministry of Communications (Railway Division). The tender No. is PRS-58/Carr/2. Tenders addressed to the Director-General (Railways), Railway Division, Ministry of Communications, Government of Pakistan, Karachi, must be enclosed in sealed covers superscribed "Tender for shipment of B.G. and M.G. Carriages." The closing date is May 5, 1958. The Board of Trade reference is ESB/9996/58.

1,764 broad-gauge wagons CR & CMR types in dismantled condition.

The issuing authority is the Ministry of Communications. The tender No. is PRS-58/WAG/4/SHPT. Bids should be

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sent to the Director-General (Railways), Railway Division, Ministry of Communications, Government of Pakistan, Karachi. The closing date is May 7, 1958. The Board of Trade reference is ESB/9997/58.

From Australia:

10 diesel-electric locomotives, 900/1,000 h.p., complete with all auxiliary and protective equipment, spare parts, and one complete set of working drawings.

The issuing authority is the Victoria Railways. The tender No. is 61,306. Bids should be sent to the Secretary for Victorian Railways, Railways Administrative Offices, Melbourne, C.1. The closing date is May 14, 1958. The Board of Trade reference is ESB/10109/58.

From Sudan:

15 standard wagon underframes.

The issuing authority is the Controller of Stores, Sudan Railways, Atbara. The tender No. is 1731. The closing date is June 7, 1958. Specifications and drawings giving full particulars of these underframes can be obtained from the Office of Controller of Stores, Atbara, on application. The Board of Trade reference is ESB/9768/58.

From South Africa:

23 items of ferrous overhead track fittings including single suspension clamps, towerhooks, turn buckles, thimbles, crosby clips, earth wire clamps, steady tube sockets, clevis fittings, clevis pins, contact ending cones, cross span fittings, steady arms, hockey sticks, catenary strain clamps, and double suspension clamps.

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, endorsed "Tender No. C.7186: Ferrous Overhead Truck Equipment Fittings," should be addressed to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. The closing date is May 9, 1958. The Board of Trade reference is ESB/9178/58.

From Portuguese East Africa:

56,400 galvanised rail bolts.

The issuing authority is the Ports, Railways & Transport Department, Lourenco Marques. The tender No. is A/CFB/1/1-21/58. The closing date is May 19, 1958. A provisional deposit of Esc. 5,000 must be made by tenderers. Local representation is essential. The Board of Trade reference is ESB/9454/58.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

The Director-General, India Store Department, Government Building, Bromyard Avenue, Acton, London, W.3, invites tenders for the supply of wheel centres or solid disc wheels, and rough turned axles. See Official Notices, on page 496.

will be run by the B.T.C. as a part of the nationalised railway system or by private enterprise.

Mr. Harold Watkinson, in a written reply: If built, the suggested railway link would be operated by the B.T.C.

Parliamentary Notes

Repayments by Nationalised Industries

The Chancellor of the Exchequer, Mr. D. Heathcoat Amory, in his Budget speech on April 15, said that issues to the nationalised industries (other than the National Coal Board) he put at £370 million, an increase of £75 million over last year. "The bulk of this increase," he said, "is accounted for by the B.T.C., of which the investment programme is getting into gear, and which, last year, were able to keep down its borrowings from the Exchequer by using balances available for investment. Repayments by the nationalised industries in respect of earlier borrowings are, however, expected to be £16 million higher than last year. Finally, £61 million is likely to be required for the Commission under the Transport (Railway Finances) Act to meet its current deficit, as against £66 million last year. These capital requirements are within the limits laid down by the Government last September for investment in the public sector."

Borrowing by the B.T.C.

The Chancellor also referred to the power to make advances from the Exchequer to the nationalised industries (other than the National Coal Board) which was first given in the Finance Act of 1956. That power expired on March 31 of this year, but was extended to August 31 by the Nationalised Industries Loans Act, which received the Royal Assent last month.

"Parliament passed that Act," explained Mr. Amory, "on the understanding that I would make substantive proposals in this Budget either to abandon or to continue the practice of using the Exchequer as the source of capital finance for these bodies. I have decided to recommend that the practice should continue, at any rate for another year. The reasons which led the Prime Minister to propose this course in 1956 hold good in market conditions today. They were set out cogently in his Budget statement and I will not repeat them. It is still the case that these industries cannot in practice borrow on their own credit. If they borrow on Government credit there are decisive reasons of market management for centralising the raising of the money in the Exchequer. The renewed powers, for which I propose to move a Procedure Resolution, will expire on August 31, 1949, so that the matter may be reviewed again in next year's Budget."

Mr. H. Gaitskell, Leader of the Opposition, concluding a general criticism of the Budget statement, said there was open to the Chancellor to take one simple step which he should have thought was not very difficult, in the light of the fact that he had given a certain amount away, and of the fact that there was some slack in the economy. "He could have allowed the B.T.C. to go full steam ahead with its investment programme. He could have made possible a rise in productivity, which he himself says he wants in industry, and that at least would have been a gesture which might have made easier a settlement of this exceedingly difficult [railway] dispute."

Notes and News

Collision at Level Crossing.—Three occupants of a motorcar were killed in a collision with a passenger train at a level crossing at Dunham Massey, near Altringham, Cheshire, London Midland Region, on April 21. The car was carried 300 yd. along the track before the train stopped.

Expansion of Wolf Electric Tools Limited.—An additional factory has been acquired in the Slough Trading Estate by Wolf Electric Tools Limited. The premises, which will make available an extra 15,350 sq. ft. of floor space are to be used for promoting planned technical developments.

Rebuilt Station at Enfield Town Official Opening.—The rebuilt station at Enfield Town, British Railways, Eastern Region, is to be officially opened today by the Mayor of Enfield, Alderman E. L. MacKenzie. Before the opening a Brush 1,250-h.p. diesel-electric locomotive and prototype passenger rolling stock are being displayed at the station.

Edinburgh-Leith Diesel Service.—The third stage in the modernisation of the Edinburgh suburban train services will be reached on May 5, when diesel railcars will replace steam traction on the Edinburgh Princes Street to Leith North service. There will be a considerable increase in the number of trains on Mondays to Saturdays, 27 each way compared with 15 each way Mondays to Fridays, and seven on Saturdays. During the morning and evening peak periods and at midday a 20-min. service will be provided.

London Midland Region (London) Orchestral Society Concert.—An orchestral concert will be given by the London Midland Region (London) Orchestral Society on Thursday, May 15, at 7.15 p.m., at the St. Pancras Town Hall, Euston Road, N.W.1. Among the items to be given is a pianoforte solo by Iain Kendell of Beethoven's "Emperor Concerto op. 73," "Rosamunde" by Schubert, and "William Tell," by Rossini, by the London Midland Region (London) Orchestra, leader George Elwitt, and hon. conductor John Grindley.

Stewarts and Lloyds Cuts Production.—Further cuts in production have been announced by Stewarts and Lloyds Limited at its largest works, situated at Corby, Northamptonshire. Recently one of two electric furnaces in the steelworks were taken out of operation, and a strip mill started on two-shift working instead of three. Although some 45 men have become redundant, all will be absorbed elsewhere at the works. Short-time working has been eased by an order for 4,700 tons of steel tubes placed by the Chinese Government.

Further L.M.R. Diesel Services.—Diesel railcars went into service on April 14 on the Lincoln-Nottingham-Derby and Nottingham and Leicester lines of the London Midland Region. The running times are approximately one hr. between Nottingham and Lincoln; 34 min. between Nottingham and Derby; 51 min. between Nottingham and Leicester; 66 min. between Leicester and Burton; and 79 min. between Leicester and Birmingham. Many of the diesel cars provide a through service between Lincoln and Derby. There are many more trains than formerly, and generally these run at

Questions in Parliament

London Airport Rail Link

Sir Alfred Bossom (Maidstone—C.) asked the Minister of Transport & Civil Aviation on April 16 whether the suggested railway link, to be constructed between London and London Airport,

hourly intervals. At peak traffic periods the diesel services are augmented by some existing steam trains. Good connections are also available between the Birmingham-Leicester and Leicester-Nottingham services and at Trent between the Leicester-Trent-Nottingham and Derby-Nottingham-Lincoln services. The sets are stated to be two-car units built by Cravens Limited, of Sheffield, of the type already supplied to British Railways.

A. Reyrolle & Co. Ltd. Results.—A record value of orders was received in 1957 by A. Reyrolle & Co. Ltd., electrical engineers and manufacturers, and as they were spread over the entire range of switchgear, a well balanced production was obtained, and output increased over 1956. Group net profit was £1,353,086 against £1,259,920, and the dividend is unchanged at 17½ per cent.

E. H. Jones (Machine Tools) Limited.—It is announced that new premises have been completed for E. H. Jones (Machine Tools) Limited at Edgware. The accommodation consists of a large warehouse for used machines, and a showroom equipped for working demonstrations. The London area address of the company is now 48, High Street, Edgware; the telephone number is Edgware 4488/9.

Machine Tool Orders.—The value of orders in hand by the machine tool industry again fell in January, and at £75,300,000 now represents less than nine months work at current rates of output. New orders received during the month, however, totalled £6,600,000, which is almost the same as the monthly average for 1957, and better than any month since July last year, but the rate of orders is considerably lower than that of 1956 and especially 1955.

Broom & Wade Mechanical Handling Exhibits.—Broom & Wade Limited exhibits at the Mechanical Handling Exhibition, to be held at Earl's Court, London, from May 7-17, will include a range of pneumatic hoists with capacities from ½-ton, fitted with link chain, roller chain and wire rope. A feature of this range will be the ½-ton hoist, which weighs 25 lb. Other equipment will be air-operated winches, including a warping drum winch specially designed as a sediment hoist, Aro-Broomwade spring balancers, with 5 and 10 lb. capacities, and Aro-Broomwade drills and screwdriver-nut runner, besides examples of stationary air compressors.

British Standard for A.C. Transmission and Distribution System Voltages.—A further revision of B.S. 77 has been published mainly because of the changes in the organisation of the electricity supply industry in the United Kingdom since the last edition appeared; the scope of the standard has been extended to cover industrial systems as well as public supply systems. The edition is in close agreement with Publication 38 of the International Electrotechnical Commission, particularly as regards the upper voltage limit associated with each system voltage. Only 415/240 V. is now recognised as standard for three-phase four-wire distribution systems. The number of standard voltages above 1,000 V. has been reduced, but 330 and 380 kV. have been added to the list. Preferred voltages for new installations are clearly indicated. Copies of this standard, BS.77:1958, may be obtained from the Sales Branch, British

Standards Institution, 2, Park Street, London, W.1. The price is 3s.

New Tunnels for Post Office Railway.—Work is nearing completion on new lengths of tube for the G.P.O. underground railway, which carries mail between the larger London sorting offices and some of the main railway termini. A stretch of line has had to be constructed to serve a new Western District office in Rathbone Place, W.1. A new station also is to be built.

Road Casualties in February.—The road casualty figures for last February, issued by the Ministry of Transport & Civil Aviation, show that total casualties among road users numbered 17,733: 368 killed; 4,103 seriously injured; and 13,262 slightly injured. Compared with February, 1957, these figures show increases of 86 in the number killed, 645 in the seriously injured, and 2,171 in the slightly injured. Traffic in February is estimated to have been 36 per cent greater than in February of last year when petrol rationing was in force. Road casualties increased by about 20 per cent.

Super Oil Seals & Gaskets Co. Ltd. Results.—The chairman's statement given at the annual meeting of the Super Oil Seals & Gaskets Co. Ltd., reports that the company is at present in the midst of the busiest period that it has ever experienced. This is reflected in the trading profit brought into the profit and loss account of £280,859 for the year ended December 31, 1957, which shows an improvement of £39,619 on the previous year. After providing for depreciation and other charges, the net profit before taxation was £207,136 (£172,311). A further £9,000 has been invested in the Australian company, Super Seals Pty. Ltd., during the year. Notwithstanding the good profit made in 1957, the previous year's final dividend of 20 per cent has been repeated. This makes

27½ per cent for the year against 30 per cent for 1956, thus retaining in the company approximately 50 per cent of the year's profits after taxation.

Lancashire Dynamo Group Ipswich Office Opened.—The Lancashire Dynamo Group have opened a new sales and service office in Ipswich to provide improved facilities to customers of all companies in the group. The territory covered from this office will include Suffolk, Norfolk, Cambridgeshire, Huntingdonshire and the northern half of Essex. The address is 12, Princes Street, Ipswich (tel.: Ipswich 56141/2).

Radio Telephone Equipment for Parcels Road Vans.—British Railways are shortly to equip parcel vans which collect vegetable and flower produce from growers in the Fylde district of Lancashire with two-way radio telephones so that the drivers out on the road can be diverted immediately to a grower who has made a request for collection. The result is expected to be quicker collection, a more economical use of transport, and the timing of collections to meet the convenience of the grower.

New Container Vessel for London Midland Region.—The mv. *Container Enterprise*, the first of two new vessels ordered by British Railways, London Midland Region, for the Northern Ireland container freight service, made her maiden voyage from Heysham to Belfast on April 21. The new vessel, with a capacity for some 65 large containers, will improve the service which has transported more than 105,000 containers between Heysham and Belfast in the last five years. During that time the traffic has grown from a total of 17,243 in 1953, to 25,225 in 1957. With the aid of new cranes and appliances at Heysham and Belfast, now in course of installation, it is considered the loading and unloading of containers will be

Scottish Region Publicity



Window display in the British Railways Travel Centre, Regent Street, London, arranged by the Public Relations & Publicity Officer, Scottish Region

speedier than the roll-on roll-off method. The vessel was built by the Ailsa Shipbuilding Company of Troon, which is supplying a second ship of similar type.

Railway Benevolent Institution.—At a meeting on April 21 the Board of the Railway Benevolent Institution granted annuities to seven widows and 10 members involving an additional liability of £374 a year; 116 gratuities were also granted amounting to £1,071 to meet cases of immediate necessity. Grants made from the Casualty Fund during the month of March amounted to £1,639.

Substantial Orders for Hoffmann.—The Hoffmann Manufacturing Co. Ltd. has a substantial order book and although there is a slight falling off in certain directions, there is no reason to suppose that there should not be a reasonably successful year ahead. In 1957 the group net profit of £647,026 compared with £548,277 previously, due to record turnover. This was caused by new plant and machinery and new methods. The tax free dividend was increased 5 per cent to 17½ per cent. Net current assets are £3,873,883 (£3,359,078). Reserves of £3,704,168 (£3,303,704) and future tax, pensions and so on of £931,490 (£821,490) are provided.

Montreal Locomotive Works Limited.—Net income of the Montreal Locomotive Works Limited, during 1957 totalled \$1,638,000, compared with \$1,427,000 in 1956. Net working capital at the end of the year was \$7,991,000, compared to \$7,217,000 at the end of 1956. In 1957 record levels of output were achieved for diesel-electric locomotives and for thermal equipment for the petroleum refining and chemical processing industries. In the domestic locomotive market an increase is reported in the sale of high-power main-line locomotives, largely as a result of the introduction in the latter part of 1956 of a new, more powerful 1,800-h.p. diesel engine. During the year, a new 2,400-h.p. locomotive, designed for special heavy duty and high speed applications, was introduced. This unit was described in our issue of November 8, 1957. In the export market, the company completed, during the first half of 1957, an order, received in 1956, for 25 diesel "World" class locomotives for the Argentine State Railways.

Forthcoming Meetings

- April 29 (Tue).—Institute of Transport, at the Connaught Rooms, Great Queen Street, London, W.C.2, at 12.30 for 1 p.m. Informal luncheon.
- May 1 (Thu).—Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, 1, Birdcage Walk, London, S.W.1, at 5.30 p.m. Film evening.
- May 1 (Thu).—The Model Railway Club, at Caxton Hall, Westminster, S.W.1, at 7.45 p.m. Talk on "Modelling the Furness Railway (Part 2)," by Mr. R. D. Pochin.
- May 2 (Fri).—The Railway Club, at the Royal Scottish Corporation, Fetter Lane, E.C.4, at 7 p.m. Paper on "London to Inverness by day," by Mr. H. A. Vallance.
- May 9 (Fri) to May 11 (Sun).—Permanent Way Institution, London Section. Visit to Essen, at the invitation of Verband Deutscher Eisenbahn-Ingenieure E.V.
- May 10 (Sat).—Permanent Way Institution, Leeds & Bradford Section. Visit

to the Forth Bridge and a modern marshalling yard near Edinburgh.

May 10 (Sat) to May 18 (Sun).—Railway Students' Association, annual convention in Switzerland.

May 12 (Mon.) to May 15 (Thu).—Institution of Locomotive Engineers, Summer meeting in Northern Ireland and Eire.

Railway Stock Market

The sharp rise in stock markets which followed the Budget has been fairly well maintained, particularly by industrial shares; sentiment as to these was helped by calculations as to the benefits many companies may derive from the flat rate of 10 per cent for profits tax. In fact, the emphasis seemed to switch from British Funds to industrial shares, although there is still a good deal of confidence in the City that the bank rate will come down to 5 per cent in the near future. It is recognised, of course, that although the change in the profits tax is welcomed, it will not mean anything like a general increase in dividends for the current year. Dividends must necessarily turn mainly on the earnings in any particular period, and this year many industries have indicated that their profits are running below the level of a year ago because of higher costs and increased competition.

Foreign rails reflected the better trend in stock markets and recorded a number of gains. Antofagasta ordinary and preference improved to 17½ and 35 respectively, while Costa Rica ordinary stock has been firm at 18, and Chilean Northern debentures were 36. International of Central America common shares and preferred stock were 20½ and \$117 respectively, while in other directions, Nyasaland Railways shares were 9s. 9d. and the 3½ per cent debentures 60½.

There was a little buying of San Paulo Railway 3s. units, which strengthened in price from 2s. to 2s. 3d. but United of Havana second income stock remained at 5s., though in other directions, Mexican Central "A" bearer debentures eased to 67.

Canadian Pacifics have shown small fluctuations, and were slightly lower on the week at \$45½, while White Pass were firmer at \$13½, and Peru Transport "B" shares strengthened to \$1.

Rather more business was reported in shares of locomotive builders and engineers, Beyer Peacock 5s. units improving to 8s. 4½d. while Charles Roberts 5s. shares have been rather more active around 8s. Birmingham Wagon were 17s. 3d., while Gloucester Wagon 10s. units have changed hands around 13s. 3d. and Wagon Repairs 5s. shares around 13s.

Alfred Herbert have risen sharply from 64s. 1½d. to 67s. 6d. while elsewhere, Craven Bros. 5s. shares moved up from 7s. 1½d. to 7s. 6d. Vickers at 32s. 6d. responded to the past year's higher profits; the unchanged 10 per cent dividend was in accordance with general expectations. In other directions, Pressed Steel 5s. shares have moved up from 15s. 1½d. to 15s. 6d. and shares of the Dowty Group became more active around 34s. 6d. but elsewhere, best levels were not held by Associated Electrical, which eased to 50s. 6d. General Electric at 33s. and English Electric at 55s. 9d. also failed to hold all earlier gains. Similarly there was also a little profit-taking in T. W. Ward, which eased to 56s. 3d. Tube Investments were fairly steady at 53s. 6d. G. D. Peters provided a good feature, rising from 30s. to

31s. 3d. in response to the chairman's annual statement, particularly to the news that orders are running at a record rate for the company.

Westinghouse Brake shares were good at 38s. In other directions, however, British Aluminium receded to 41s. 6d. xd. Guest Keen strengthened to 51s. 9d. and British Oxygen showed firmness at 35s. 3d. but after an earlier rise, there was some profit-taking in Babcock & Wilcox, which eased to 48s. 9d. Ruston & Hornsby have been fairly steady around 25s. 9d.

OFFICIAL NOTICES

CIVIL ENGINEERS: British railway in Central Africa requires JUNIOR CIVIL ENGINEERS, aged 23-35, married men preferred. Applicants should have some Railway experience. Salary £1,000-£1,410 p.a., commencing salary depending upon qualifications. Family allowance, unfurnished house rent free, pension scheme, six months leave on full pay every 3½ years with free passages. Write stating full particulars, age, marital status, training, experience and previous appointments to Box "Z.E." c/o J. W. Vickers & Co. Ltd., 7/8 Great Winchester Street, London, E.C.2.

THE NIGERIAN RAILWAY CORPORATION invites applications for the following post: **SENIOR SIGNAL & TELEGRAPH INSTRUCTOR.** Duties: The Senior Signal and Telegraph Instructor will be required to prepare syllabuses, organise classes and instruct apprentices in all aspects of Signal and Telegraph work, as applicable to railways which shall fully cover Mechanical Signalling, Double Wire Mechanical Signalling, Telephone Train Control, Selective Ringing Systems, Single Line Block Token Instruments, including Key Token Instruments, also Telegraph and Telephone circuits, and Automatic Telephones. Qualifications: Candidates should be about 35 years of age and be Corporate Members of the Institute of Railway Signal Engineers and A.M.I.E.E. or equivalent. They should have served a regular apprenticeship in the Signal and Telegraph Department of a Railway or with a firm of Railway Signal Engineers engaged in the manufacture and installation of Rolling Signal and Telegraph appliances, and have a knowledge of track circuits, colour light signals, electrical detection, etc., ability to demonstrate signalling and telegraphy apparatus in service, and conduct periodical oral and written examinations is also required. Previous teaching experience of the aforementioned subjects will be an advantage. Salary: In scale £1,450 by £50 per annum to £1,750 (inclusive of Overseas Pay) per annum. Starting salary according to qualifications and experience. Appointments may be on pensionable or on contract with a gratuity payable on completion of contract at the rate of £25 s. 4d. to £29 s. 4d. for each completed month of service. Tours: 15 months in Nigeria followed by 15 weeks' leave on full pay. Quarters: Partly furnished quarters are provided at low rental. Allowances: There are attractive family, travelling, transport and other allowances. Send postcard before 31st May, 1958, mentioning the post and this paper for further particulars and application form to: The London Representative, Nigerian Railway Corporation, Nigerian House, 9 Northumberland Avenue, London, W.C.2.

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THE Director-General, India Store Department, Government Building, Bromyard Avenue, Acton, London, W.3, invites Tenders for the supply of: S1722/58/GNK/HAL: (a) 2,400 WHEEL CENTRES assembled with tyres and glut rings; I.R.S. drawing Nos. W501 alt 14, W502 alt 9, W1662 alt nil, R. Sketch No. 014 and to I.R.S. Specifications R-15 and R-19; or alternatively, (b) 2,400 SOLID DISC WHEELS rolled or forged steel; I.R.S. drawing No. W1660 alt nil, and to I.R.S. Specification R-19; 1,200 AXLES rough turned; H.A.L. drawing No. 411-100002 and to I.R.S. Specification R-16. The Tender forms with schedules and specifications which are returnable on Thursday the 22nd May, 1958, may be obtained from the above office (C.D.N. Branch) on payment of a fee (which is not refundable) of ten shillings for each Tender. The applications for Tenders should clearly state the reference numbers of the tenders required.

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